

FIFTEENTH REPORT

(SEVENTH BIENNIAL)

OF THE

STATE BOARD OF HEALTH

AND

VITAL STATISTICS

OF

MINNESOTA, 1893-94.

CONTAINING

REPORT OF THE WORK OF THE BOARD, BY THE SECRETARY,
WITH APPENDICES.

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OFFICE OF THE STATE BOARD OF HEALTH
AND VITAL STATISTICS,
ST. PAUL, MINN, Jan. 1, 1895.

To His Excellency, Knute Nelson, Governor;

SIR: I have the honor to transmit herewith the report of the work of the State Board of Health and Vital Statistics for the period of two years, from Jan. 1, 1893, to Jan. 1, 1895. It includes:

First—The report of the work of the Board by the secretary.

Second—The Financial Statement of the Board—Appendix No. I.

Third—Summary of analyses of water in laboratory of board—Appendix No. II.

Fourth—Statistics of glanders in the state and records of the use of mallein for the diagnosis of that disease—Appendix No. III.

Fifth—Selections from the tracts issued for popular distribution by the Board—Appendix No. IV.

The "Fourth Biennial Report," by the secretary, on "Vital Statistics of the State of Minnesota," for the years 1892 and 1893, is now in the hands of the printer and will be published separately.

Very respectfully, your obedient servant,

CHARLES N. HEWITT,

Secretary and Executive Officer.

MEMBERS OF THE STATE BOARD OF HEALTH AND VITAL STATISTICS.

FRANKLIN STAPLES, M. D., President,	Winona.
CHARLES N. HEWITT, M. D., Secretary and Executive Officer,	Red Wing.
W. H. LEONARD, M. D.,	Minneapolis.
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WARREN L. BEEBE, M. D.,	St. Cloud.
KNUTE HOEGH, M. D.,	Minneapolis.
EDWARD BOECKMAN, M. D.,	St. Paul.

All official correspondence should be addressed to the secretary, the executive officer of the Board, 515 Pioneer Press building, St. Paul, Minn.

LAW AMENDING CHAPTER 15, GENERAL LAWS OF 1872, AS TO REORGANIZATION OF THE STATE BOARD OF HEALTH.

CHAPTER 97, LAWS 1893.

An act to amend sections one (1) and three (3) of chapter fifteen (15) of the General Laws of one thousand eight hundred and seventy-two (1872), relating to the appointment of the members of the State Board of Health and Vital Statistics, and the management of its business.

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. That section one (1) of chapter fifteen (15) of the General Laws of the State of Minnesota, for the year one thousand eight hundred and seventy-two (1872), be and the same is hereby amended to read as follows:

SEC. 1. There shall be a State Board of Health and Vital Statistics, to be appointed by the governor as hereinafter stated. The term of office of all of the present members of the said Board of Health and Vital Statistics shall terminate on the first day of January, A. D. 1894, and on that day, or as soon thereafter as practicable, the governor shall proceed to appoint a new board, consisting of nine (9) members, three of whom shall be appointed to serve for a term of one (1) year, three (3) of whom shall be appointed to serve for a term of two (2) years, and three (3) of whom shall be appointed to serve for a term of three (3) years; and thereafter the governor shall appoint on the first day of January of each year, or as soon thereafter as practicable, three (3) members of said board, who shall serve for a term of three (3) years. And in case of any vacancy occurring in the board, by death, resignation or otherwise, the governor shall immediately supply such vacancy by appointment, to serve for the unexpired term.

SEC. 2. That section three (3) of said chapter fifteen (15) be and the same is hereby amended to read as follows:

SEC. 3. The board shall hold regular meetings at the capitol building, in St. Paul, on the second (2d) Tuesday in January, April, July and October, in each year, at ten o'clock in the forenoon, and such special meetings as the secretary shall deem necessary. They shall elect from their own numbers the following named officers, to-wit: a president and permanent secretary.

The secretary shall be the executive officer of the board, and shall be entitled to such compensation, in addition to that now provided by law, as the board in their discretion may deem necessary. Provided, that in case of absence from the state, of the secretary of the board, or in case of his inability, for other cause, to discharge the executive duties of said office, then and in such case the president of said board shall act as the executive officer of said board during the absence of said secretary, and the board may allow the president such compensation for his services as they may deem reasonable; and the said board may appoint such quarantine officers, inspectors, assistants and other agents as they may deem necessary.

SEC. 3. This act shall take effect and be in force from and after its passage.

Approved April 17, 1893.

REPORT OF THE SECRETARY AND EXECUTIVE OFFICER.

I respectfully submit a summary of the work of the Board for the years 1893-94. It has been of two kinds, within and without the state.

Without the State—Our relations with national and state public health organizations are important and increasing. They include the mutual notification of infectious diseases of men and co-operation in their study and control. Because of their importance, this board has for many years endeavored to reduce them to a practical and useful basis. The plans which we proposed several years ago and fully described in the fourteenth report of this board (1891-92) are established methods now.

1. SEACOAST NOTIFICATION OF INFECTIOUS DISEASES OF MEN—*The Marine Hospital Service, the Immigration Bureau of the United States Treasury Department, and the Quarantine Service of the Dominion of Canada* send immediate notice of the date, number, name and destination of all persons landing at the Atlantic or Pacific seaboard, or on our lake border, who have had, or been exposed to, infectious diseases and are coming to Minnesota.

This enables the secretary (generally before their arrival) to notify the local boards of health interested, to provide, by inspection, isolation and disinfection, as need be, against the infection of disease in body, baggage or clothing of such persons.

There have been received during 1893-94 from the Marine Hospital Service 83 notifications of 1022 persons exposed to or suffering from infectious disease.

There have been received from the Immigration Bureau of the United States Treasury Department, port of New York, 95 reports of 1,511 infected with or exposed to diseases, and en-route to Minnesota.

From the Dominion Quarantine Service 3 notifications of persons exposed to or suffering from infectious diseases.

2. INTER-STATE NOTIFICATION OF INFECTIOUS DISEASES OF MEN BY SECRETARIES OF STATE BOARDS OF HEALTH.—This work includes also the provinces of New Brunswick, Quebec, Ontario and Manitoba.

Because of the lack of efficient local board organization and obligatory notification of such diseases by local to state boards of health in the majority of states, this co-operation is not what it ought to be. Fortunately for us the neighboring state boards of health of Indiana,

Illinois, Ohio, Wisconsin and Iowa have been able to notify generally of smallpox, and joined in a conference in 1894 on the subject, called by a representative of this board, in Chicago, when important arrangements with railroads were put into practical operation.

Our greatest danger from this disease in 1894 has been in Chicago and Milwaukee. I am glad to report the heartiest co operation and assistance by the state boards of Wisconsin and Illinois and the commissioners of health of Chicago (Dr. Reynolds) and of Milwaukee (Dr. Kempster).

It is proper to add that I have visited Milwaukee repeatedly during the past year, in conference with the state board of health and Dr. Kempster upon the prolonged epidemic of smallpox prevailing there, and that every reasonable request for the protection of Minnesota has been promptly granted. Although their fight against smallpox has been very much interfered with by official opposition and mob violence, they have succeeded beyond reasonable expectation in limiting the disease almost entirely to one portion of the city of Milwaukee, and nearly prevented all escape therefrom.

I wish officially to acknowledge the prompt, tactful, efficient and continued assistance of Mr. J. W. Underwood, the division superintendent of the Chicago, Milwaukee & St. Paul Railroad at Milwaukee, in taking the steps suggested for the prevention of the transfer of the infection by rail to Minnesota, and for daily telegrams of the railroad inspection, which he has sent to me for several months.

3. NOTIFICATION AND CONTROL OF THE INFECTIOUS DISEASES OF ANIMALS.—*The Bureau of Animal Industry* of the United States Agricultural Department (through Dr. D. E. Salmon, its chief) has given me notification, advice and assistance in this direction. He has sent an inspector of his department to our assistance when asked, and has furnished us with a large amount of mallein for the diagnosis of glanders in horses, and tuberculin for the diagnosis of tuberculosis in cattle, for both of which there is a large demand.

I am under obligations, also, to the bacteriological laboratory of the Bureau of Animal Industry (Dr. Theobald Smith) for bacterial cultures and counsel.

The Marine Hospital Service, through its bacteriological laboratory (Passed Assistant Surgeon J. J. Kinyoun), has given me bacterial cultures, personal instruction in the production of antitoxine, and a supply of diphtheria toxine for the inoculation of a horse now under experiment at the vaccine station.

Within the State my duty has been, as usual, daily correspondence, counsel and co-operation with local boards of health in the decision of the various questions constantly arising in the execution of the law. Our common work has included the prevention or control of infectious

diseases of men or domestic animals, the location and regulation of offensive trades, the sanitary inspection of localities, the removal of nuisances or causes of sickness which such inspection has discovered, the collection and registration of births and deaths, mutual notification of sanitary dangers and mutual co ordination of effort for the promotion of public health.

The State Public Health Service, consisting of the state and local boards of health, co ordinated by law and in active co-operation, is now an accomplished fact under the common law—chapter 132, General Laws of 1883.

There are now in the state 1,362 townships, in all but two of which the boards of supervisors have assumed the duties of a board of health. They represent (census of 1890) 708,369, or 54.4 per cent, of the population of the state, and nearly all of its area.

Duties and Work of the Chairman—There are very few medical men residing in townships, so that of necessity the chairman is the acting health officer. Immediately after his election he is supplied with a full file of all the publications of the state board relating to his work—Appendix No. IV. All his requests for aid and information are promptly answered by the secretary of the state board by correspondence or in person, as may be necessary.

The experience of the last two years, as previously, shows that 54.19 per cent of the chairmen are re-elected, which means that, as respects their work as health officers, the secretary has annually more than 600 new chairmen to instruct in their duties. During the years 1893-94 he has sent to the chairmen of township boards 79,510 circulars of instruction, copies of laws and blanks for report. During that time they have written him 3,480 letters asking for information or advice, and he has written them 5,312 letters in reply. As more than half of our population live in townships, and a considerable proportion of preventable disease and death occur there, the importance of the township boards is evident; but these boards work under peculiar and difficult conditions, dealing with a scattered population, isolated upon farms in groups of families, and having a common occupation.

The relations of the chairmen of these boards to the secretary of the state board have become very constant and intimate. Their correspondence during the year 1893, for example, included 603 letters about diphtheria, 229 as to scarlatina, 34 as to smallpox, 352 as to glanders, 23 as to rabies, and 373 upon miscellaneous topics. A considerable proportion of these diseases occur in the country districts, where, at first thought, it would seem easier to control them than in a village or city. So far as the isolation in family is concerned, this is true, but these boards lack other essentials. Physicians are rarely in residence, but must be called from villages or cities more or less

remote, and there is no provision for hospital accommodation. I can add nothing to the force of the following quotation from my last report, except to state that the need is greater than ever, and that no provision has been made to supply it:

"The Need for Nurses in Townships—Nurses trained to the care of infectious diseases are not to be had, and those of the average sort find better wages, accommodations and facilities in villages and cities, so that they are difficult to secure in townships even for greater wages than poor people can, or local boards are willing, to pay. I am sure that those who ought to supply this grievous need are not aware of its extent or importance. I can give many illustrations of it from the pitiful appeals of chairmen to the State Board for *any nurse* who can do something to lighten the burden of the mothers of families stricken with diphtheria (for example) who are utterly unable properly to care for them. Add to this, lack of roomy houses, and proper food or cooking, and frequent deaths, with no help except what the chairman and others can give on the outside of the house, and one can form an idea of conditions repeatedly paralleled in the experience of township boards of health. Infectious diseases prevail largely among children, and commonly in the families of newcomer farmers, with scarcely any accommodations or knowledge for their care, able to speak only their own language and ignorant how to apply for help or what to ask for.

"No one who has any knowledge of the facts can charge this lack of efficient and sufficient nursing to any want of neighborly feeling or to heartless disregard of the needs of others, for it would be unjust and untrue. There are none, or very few, unemployed women in any farming community; all are busy and many find little time for social enjoyment, much less for the prolonged isolation which the nursing of the sick of infectious disease always demands. Mothers of families have to consider the danger to their own children which such services to others involve under the peculiarly difficult circumstances here referred to, so that it is not difficult to account for the lamentable fact that proper nursing is often wanting in country districts.

"I have repeatedly called the attention of the board and of the public to this subject, and I should fail in a very important part of my duty did I neglect any opportunity to impress upon all churches and Christian people to examine into this need and help to supply it.

"Common humanity and public safety demand that no time be lost in making the needful arrangements for providing a supply of competent women nurses, willing to serve in the care of infectious diseases in country districts, and arranging, in part at least, for their compensation.

"It must not be forgotten that the need for this aid varies exceedingly. Sometimes we could use a half dozen in a single township; at other times we do not know where to use one. But, as we have no supply, the demand is mostly from those in despair of other help, while if it was known that a supply was available, I am sure the deserv-
ing calls would exceed it.

"How to Prevent the Spread of Infection in Families. Isolation Houses—Buildings plainly furnished belonging to one or several adjacent townships and available as places of refuge for *well* children of a family in which infectious disease appears, would be of inestimable advantage and the means of limiting the victims to the first attacked.

"This is proved by the fact that we have the record of many outbreaks (of diphtheria, for example) in which the removal of the *well* children to the family of a relative or friend where were none, or grown-up children, has saved them from the disease and enabled the mother to devote her attention to the sick exclusively, to the mutual advantage of sick and well. The home in this way becomes a hospital from which all but the sick and attendants are excluded, and to which any other of the children taken sick can be immediately returned. The result has repeatedly been that there was but one, or possibly two, sick where if all had remained at home all would have probably taken the infection. This removal to a place of safety in another family is, unfortunately, rarely possible. Such a building as is needed would cost but a few hundred dollars. The furnishing need be only a few iron bedsteads, some chairs and a small cook stove; all the rest would come from the home of the family affected, as would care-taker, food and other necessities. In case the family were a town charge this arrangement would be cheaper than to care for the same children *sick* at home.

"Despite the difficulties incidental to their organization, limited term of service and consequent inexperience, some of the most efficient sanitary service in the control of infectious disease has been done by farmers,—chairmen of township boards of health,—as above demonstrated. This steady advance of these boards through the activity of their chairmen is perhaps the most noteworthy fact in the working of the State Public Health Service for the past two years."

Legislation for Township Boards of Health—This board have repeatedly asked the legislature to so adjust the law for the election of township boards of supervisors, that they be selected for one, two and three years. This is, I believe, the rule as to school boards and other similar organizations, and if needed there, is certainly imperative here. For the duties of the chairman and of the board, as a board of health, require a longer experience than one year's service can possibly give, and as a consequence they are compelled to consult the Secretary of the State Board of Health upon matters of routine duty, which a longer experience would have taught them to perform.

Duties and Work of the Clerks of Townships—These officers are responsible to the Secretary of the State Board of Health for the monthly report of births and deaths in their township, and upon the accuracy of the causes of the last depend very much of the knowledge which the secretary may have as to the existence of infectious disease in the country districts.

Fortunately, 78.71 per cent of these officers are re-elected (this is the average of seven years), and some of them have served for a long term of years. From their familiarity with local affairs and their wide acquaintance, many of them become the correspondents of their boards, and are of material assistance in the knowledge and control of infectious diseases of animals and men.

City and Village Boards of Health—St. Paul and Minneapolis have a commissioner of health, serving with a committee of the council. There are thirty-four other cities who have boards of health organized under the state law, with a medical man as health officer. There are 313 villages and boroughs in the state. All but twenty-five have boards of health; 208 have physicians as health officers, while 76 have laymen acting till medical men can be found to serve.

I am sorry to repeat the statement made in my last report, that it has been a tedious and difficult work to secure the organization of boards of health in cities and villages of less than 5,000 population, and still more difficult to maintain their activity. One obstacle is the indifference of the local authorities to this appointment, and their unwillingness to provide even for their necessary current expenses. Our own experience has repeatedly proven that such provision and a contingent fund for the care of sudden infectious diseases are necessary and an economy.

It is in this respect a misfortune that the traditional willingness of physicians to serve in an emergency without thought of consideration is true of the profession in Minnesota, but it is a greater misfortune that there are villages and cities willing to unfairly avail themselves of it. Very few of the smaller cities and villages make adequate provision for the salary of the health officer or the expense of his office. It is often less than of the humblest employe of the corporation.

Of the 244 physicians who are now serving as health officers in cities, villages and boroughs, but two receive over \$2,000, one \$1,000, one \$600, two \$300, two \$200, one \$150, one \$75, one \$60, one \$66, one \$30. The rest receiving salary get an average of \$20, and more than half, no salary at all.

Any one who will take pains to read the duties of the health officer as specified in the laws (see Appendix No. IV) will discover that no one but a thoroughly educated and experienced medical man can successfully perform them, and that his professional knowledge must be supplemented by special information in chemistry and bacteriology, not to be obtained without the expenditure of time and money.

I repeat the recommendations of my last report:

“Legislation Needed—The facts ought to secure legislation for the following purposes:

1. To fix the compensation of health officers of villages and cities so that it may be sufficient to induce a capable physician to accept and perform the duty, and that he may know what is to be his income as he now knows, in the language of the law, what are his duties.

- “2. A definite provision for the current expenses of the health officer and a contingent fund for the emergency of sudden infectious disease.

"3. To define the executive machinery for the removal of nuisance or regulation of offensive trades, and provide for the various duties connected with the management of infectious diseases. All these duties are now obligatory, but the means for their performance are at fault or in dispute.

"4. To secure the local independence of health officers, in matters of official opinion and action, in dealing with infectious diseases.

"5. It is very important that the legislature make some general provision to remedy these defects in a law which is in most respects a model. (Chapter 132, section 4, Laws 1883.)"

Vital Statistics—My "Fourth Biennial Report on Vital Statistics of the State of Minnesota," for the years 1892 and 1893, accompanies this report. It includes the detailed statistics of births and deaths for the years 1892-93, as required by law, to which I have added tables, showing comparative mortality from the leading causes of death for the seven years (they are tables XXXVI. and XLVIII. inclusive, of that report). They include all that I have been able to learn from statistics, correspondence and in other ways, as to the causes of death in nearly 40,000 cases, and all other facts which are required by law (sex, age, condition, nativity, parent nativity, season, etc.).

It is no longer necessary for physicians to depend upon the conclusions of individuals of limited experience, or the statements of current text books, as probably applicable to the diseases of our population, for these tables condense the evidence of our own statistics for a series of years, verified by the practical experience of the state public health service, in the notification and practical control, for that period of time, of the diseases to which the tables relate.

The data in the footnote give some of the details of the work involved in the preparation of these tables.

The monthly report of deaths and their causes, required by our law, makes prompt revision easy, and is a very important assistance to the knowledge of locality and extent of infectious disease. For example, the returns of causes of death for 1893 reported 471 from diphtheria. These were immediately notified to the health officer or chairman for special report, who sent in the record of 420 outbreaks of this disease.

*Notification of Infectious Disease within the State and Means for their Control**—To illustrate the operation of this notification, the following statistics, made up from the daily returns, respecting diphtheria, will serve:

In 1893 health officers and chairmen gave notice to the secretary of 174 different outbreaks, in which there were 961 cases and 294 deaths. In 1894 there were reported by the same officers 136 different outbreaks, 580 cases and 132 deaths.

To correct or verify these returns, there were addressed to physicians in 1892, 1893 and 1894, 2,360 letters of inquiry, to which there were returned 2,113 replies. Besides this, in 1893 and 1894, 1,700 letters for correction of returns were addressed to and answered by health officers and clerks.

*See Chapter 132, Laws of 1883, sections 21, 22, 23, Appendix No. IV.

In 1893 these reports came from 14 cities, 31 villages and 129 townships, and in 1894 they came from 11 cities, 33 villages and 81 townships.

I call attention to the fact that out of 299 reporters, 200, or 66 per cent, were farmers, chairmen of boards of health.

When such notification of infectious disease is received by the secretary, the local board, where the disease exists, is immediately sent a full file of all the publications of the state board upon the disease, notification blanks for the use of physicians and others, posters for placarding houses, printed instructions as to the character and management of the disease for popular use, any suggestions as to the particular outbreak which seem necessary, and if required, he makes a personal visit.

This done, notice is sent to all other localities of the state who may be in danger, and if need be, several boards adjacent to the outbreak are called upon to join in mutual co-operation.

Interstate Notification of Infectious Diseases—This notification, proposed by the secretary in 1879 and formally accepted by other boards in 1886, has been of very great importance in the last two years, because of the widespread epidemic of smallpox. The attached tables will show the diseases notified and the states, territories and provinces from which the notification has been received.

NUMBER OF NOTIFICATIONS FROM DIFFERENT STATES.

Pennsylvania	86	Delaware	3
Illinois	39	West Virginia.....	1
Wisconsin.....	35	New York.....	5
Michigan	42	Indiana.....	22
Connecticut.....	27	New Hampshire.....	1
Ohio	39	Texas.....	3
Iowa	15	Rhode Island.....	4
Tennessee.....	12	Maryland	6
Maine	13	Georgia	1
Kansas	7	Vermont.....	1
Massachusetts.....	8	Dakota Territory.....	1
California	5	Arizona Territory.....	1
Louisiana	4	Province Quebec	23
Minnesota.....	16	Province Ontario	29
Missouri	3	Province Manitoba	2
North Carolina	3	Province New Brunswick.....	2
New Jersey	3		
Colorado	1	States.....	30
Alabama.....	2	Territories	2
Florida	2	Provinces	4

ABSTRACT OF INTERSTATE NOTIFICATIONS FOR NINE YEARS, 1886-1894.

YEAR.	Number of Notifica- tions Recd.	DISEASE.	Cases.	Deaths.
Total, 1886.....	2	Variola.....	4	.....
Total, 1887.....	4	Variola.....	4	.....
Total, 1888.....	94	Variola.....	624	103
Total, 1888.....	1	Typhus fever.....	1	.....
Total, 1889.....	34	Variola.....	168	17
Total, 1889.....	1	Yellow fever.....	2	1
Total, 1890.....	15	Variola.....	4	.....
Total, 1890.....	2	Leprosy.....	2	.....
Total, 1891.....	50	Variola.....	200	31
Total, 1892.....	43	Variola.....	206	81
Total, 1892.....	1	Cholera.....	1	1
Total, 1892.....	1	Leprosy.....	1	.....
Total, 1892.....	1	Diphtheria.....	130	37
Total, 1893.....	46	Variola.....	941	43
Total, 1893.....	2	Yellow fever.....	2	1
Total, 1893.....	4	Typhus fever.....	46	20
Total, 1894.....	170	Variola.....	3,990	124
Total.....	459	Variola.....	6,141	404
Total.....	5	Typhus fever.....	47	20
Total.....	3	Yellow fever.....	4	2
Total.....	3	Leprosy.....	3	.....
Total.....	1	Cholera.....	1	1
Total.....	1	Diphtheria.....	130	37

Seacoast Notification of Infectious Diseases of Men—The marked reduction in immigration in the last two years and the increased efficiency of the services at the seaports, has materially reduced our danger from this source. The following statistics give the record of its operation for the last two years.

NINETY-FIVE REPORTS FROM PORT OF NEW YORK.

DISEASE.	Persons.	Localities.
Measles	1,043	331
Diphtheria.....	71	29
Scarlatina.....	45	19
Smallpox	256	68
Smallpox, diphtheria and measles.....	35	9
Smallpox, measles and varicella	8	4
Smallpox and measles.....	22	11
Measles and scarlatina.....	31	8
Total.....	1,511	479

In addition to the above I have received 9 telegrams from the commissioner of immigration at New York warning me of the approach of 336 persons exposed to smallpox.

Of these, 6 were found to have measles, 2 diphtheria and 1 fever, after arrival.

They went to 171 different localities in 69 counties, and 479 notices were sent to the local Boards of Health, giving name, disease to which exposed, etc., of immigrants expected to arrive at their town, village or city.

There has been a very active, practical co-operation between the secretaries of the state boards of health of Illinois, Wisconsin and Minnesota, and by the health commissioner of Chicago, Dr. Reynolds, and the health commissioner of Milwaukee, Dr. Kempster.

The great railroad lines from Chicago west have promptly accepted all suggestions and given hearty co-operation in preventing the carriage of the infection by passengers and baggage.

Marine Hospital Service—I have to thank the supervising surgeon general of this service for information from his officers upon the Canadian border during the smallpox epidemic of 1893, details of which are as follows:

From H. R. Floyd, inspector at Sault Ste. Marie, 57 reports of 902 persons enroute to Minnesota and from J. McKenty, inspector at Neche, N. D., 26 reports of 120 persons enroute to Minnesota.

Mortality from Diseases of Men—That of 1893, compared with the average of seven years, 1887-1893.*

The population, as given in the United States census of 1890, is made the basis of this estimate, though the actual population for 1893 would materially reduce the proportion of deaths to population for that year. In all cases the statement is deaths to 100,000 of population.

	Average of Seven Years.	For 1893.
Tuberculosis	199.4	118.3
Diarrhoeal diseases of children.....	84.9	95.9
Pneumonia.....	66.4	67.0
Diphtheria.....	57.6	44.1
Enteric (typhoid) fever.....	42.5	43.3
Bronchitis	25.3	22.4
Croup	17.4	14.4
Scarlatina	17.4	18.6
Measles.....	10.8	3.29

Smallpox—During 1893 and 1894 has been epidemic in the United States and among the Western states, chiefly in Illinois and Wisconsin. Our greatest danger has been from the cities of Chicago and Milwaukee. We have escaped up to the first of January, 1895, with eleven outbreaks, of which seven were limited to the original case, one limited to two cases, two to three cases, one to ten cases and one to twelve cases.

This remarkable immunity of Minnesota, when other adjacent states suffered so severely, was due to the fact of immediate notifica-

* For details, see Tables XXXVIII.-XLVI. of the Fourth Biennial Report on Vital Statistics for 1892 and 1893.

tion by the local boards of health to the state board, and to the immediate isolation of the victims of the disease, the prompt vaccination and revaccination of all persons exposed to them, to the thorough disinfection of persons and things after the cases were disposed of, and to the free popular use of vaccination.

The following table gives all the details known of the disease in Minnesota during those years:

Number.	Locality.	County.	Date of Outbreak.	Supposed Origin.	No. of		Quarantine Released.
					Cases.	Deaths.	
1	Featherstone township	Goodhue.....	Nov. 3, 1893	Pennsylvania.....	2	.....	Dec. 7, 1893
2	Duluth (city).....	St. Louis.....	Feb. 7, 1894	Chicago.....	1	1	Feb. 15, 1894
3	St. Paul (city).....	Ramsey.....	Feb. 25, 1894	Chicago.....	12	1	June 13, 1894
4	Duluth (city).....	St. Louis.....	April 20, 1894	Chicago.....	10	2	July 20, 1894
5	Two Harbors (village)...	Lake.....	June 5, 1894	Duluth.....	1	.....	July 6, 1894
6	Red Clover township...	Carlton.....	June 13, 1894	Duluth.....	1	.....	July 25, 1894
7	La Crescent township...	Houston.....	June 22, 1894	Milwaukee.....	1	.....	July 30, 1894
8	Belle Plaine (village)...	Scott.....	Aug. 19, 1894	St. Paul.....	1	.....	Sept. 22, 1894
9	St. Paul (city).....	Ramsey.....	Aug. 21, 1894	Detroit, Mich.....	4	.....	Oct. 24, 1894
10	Brainerd (city).....	Crow Wing.....	Nov. 13, 1894	Unknown.....	1	1	Nov. 16, 1894
11	St. Paul (city).....	Ramsey.....	Nov. 27, 1894	Unknown.....	3	.....	Dec. 22, 1894
	Total.....				37	5	

INFECTIOUS DISEASES OF DOMESTIC ANIMALS.

Glanders in Horses.—For full details, see Appendix No. III. The struggle with this disease has been a prolonged one, chiefly because of the constant introduction of affected animals from without the state. In 1893, 189 horses were isolated by local boards of health, as suspected of glanders, of whom 137 died, or were killed because found to be suffering from the disease. In 1894, 295 horses were isolated and 184 died, or were killed.

Tuberculosis in Cattle.—Our investigations and those of like authorities in the Eastern States have been greatly facilitated by the use of tuberculin, an organic product of the bacillus tuberculosis when grown in preparations of animal fluids. This agent enables the most positive diagnosis in suspected cases of any means hitherto used. Within the last four months (September to December, 1894,) it has been used under my personal direction 372 times upon 335 cattle. Of those which it condemned, 41 have been killed to date, Dec. 31, 1894. This list included 254 animals in the herds of state hospitals at Rochester and St. Peter; but very few were in the city dairies. The post mortems have amply sustained the diagnosis. It will be noticed that the killed amounted to 12 per cent of the total number. The proportion has been larger in the Eastern States, where, under the stimulus of professional and popular dread of the transmission of the disease from cows in flesh or milk, and for other reasons, very stringent laws have been passed and enforced. In New York and Massa-

chusetts the wholesale efforts of the authorities to "crush out" the disease have resulted in bitter opposition on the part of cattle owners and dairymen, and the expenditures of large amounts of public money for inspection, quarantine, slaughter and compensation. My information, from high authorities, is, that what has been gained by these stringent measures will probably be lost in the opposition and hard feeling which they have occasioned. The plan which I have proposed to local boards of health and dairymen is very simple, and of late has been very successful. I venture to predict its continued success, not only with the approval, but upon the urgent demand of breeders, dealers and dairymen themselves.

It is founded upon the established fact that tuberculosis of cattle is a very infectious disease, communicable from the infected animal to others of the same herd, and that one such animal does, under ordinary circumstances, give the disease to another, which in turn becomes a centre of infection, till a large proportion of the herd may, in a few months time, be also infected. Of this statement we have striking proof in our own experience, and the evidence from other sources is so great as to be positive. It is therefore for the interest of breeders of cattle and dealers to discover, at the earliest moment, the existence of even a single case of this disease in their herd. It is also established by indisputable evidence that tuberculosis has been communicated from an infected animal to man in their flesh and milk, used as food, and therefore, dairymen have two reasons for testing the presence of tuberculosis in the animals which they buy. First, the danger to their herd; and, second, the danger of transmitting tuberculosis from those animals in the milk which they supply to their customers. Butchers are interested in the same question, to prevent loss on the discovery of the disease in the carcasses of animals slaughtered. Above all, is the interest of the whole population in the protection of their meat and milk supply, from this danger. The interests therefore of the producer and the consumer are alike involved in the plan here proposed, which is, that the State Board of Health supply tuberculin for the tests, free of charge, to be used under the direction of the local board of health. That all animals condemned by the use of tuberculin be sent to the slaughter; that the carcasses of those that are in apparent good health at the time of slaughter, in which the disease cannot be discovered in the glandular system or other organs of the body, after careful post mortem, be passed as fit for food; that the carcasses of all others be drenched with kerosene and buried, or sent to the rendering tank.

Some dairymen are already availing themselves of this opportunity; submitting their entire herd to the test of tuberculin and sending all which it condemns to the slaughter on the above conditions.

They are submitting all new animals to the tuberculin test before purchase, on the above conditions; and with the agreement that all cases of sickness are promptly reported to the local board of health, and that their barns, yards and utensils are kept in satisfactory sanitary condition, they receive a certificate that their herds are free from tuberculosis. In their own interest, more will follow these examples, for consumers will demand the certificate.

Again, buyers of dairy cattle are already preparing to resort to the same method for testing cows before purchase. This plan of dealing with tuberculosis enables dealers and consumers to know the facts as to the existence of the disease in a particular animal or herd, and individuals owning a single cow are asking for the test for their own satisfaction and security. When evidence is presented to the state or local board of health that one or more animals in any herd is reasonably suspected of tuberculosis, the law of the state* already provides that the suspected animals be isolated until their actual condition is certified to the board by a veterinarian of their own selection; and the other provisions of the law are such that the local or state boards can take any measures found to be necessary to prevent the spread of this or any other infectious disease of animals. The plan here proposed supplements and, when possible, forestalls the above proceeding by putting at the disposal of cattle owners the use of tuberculin for the safety of their herd and for their pecuniary advantage.

Hog Cholera—In the fall and winter of 1894, a wide-spread and fatal epidemic of a combination of diseases of swine was imported into Minnesota, it is believed, chiefly from Iowa and perhaps some other Western states.

A circular on the subject, issued in November, was sent to the local boards of all localities where the disease was known to exist. In December a request was sent to all the railroads and stock yards, asking them to co-operate with the local and state boards in securing the inspection and preventing the transportation of hogs, coming from infected districts, without or within the state, and another circular was issued and sent to all local boards, describing the disease and methods for management. (See tract on infectious diseases of hogs in Appendix No. IV.-12.)

A considerable number of post mortems have been made of infected animals, and bacteriological examination is now in progress, in co-operation with the Bureau of Animal Industry of the Agricultural Department, Washington, from which will come a better knowledge of the causes and methods of control of these diseases than we have hitherto had. The thanks of the board are due to the railroads of the state and to the stockyards of South St. Paul, New Brighton and Minnesota Transfer for helpful co-operation.

*Chapter 200, Laws of 1885, Appendix IV.-1.

Chemical and Bacteriological Laboratories — Early in the work of the state and local boards of health, the secretary was frequently called upon for the chemical analysis of suspected water supplies, and by permission of the board, established a small laboratory in his office. When a test for kerosene was made the duty of the state board, many complaints were made as to the quality of that product, and Governor Hubbard ordered an extended investigation. Then came questions as to the existence of lead in tinware and glazed cooking utensils, then search for the poisonous products of decay in smoked fish and canned foods. Meantime, the analyses of water had increased in number and variety. Thus the chemical laboratory became a very important help in the everyday work of the secretary's office.

A few years ago, when the causes of many diseases were found to be associated with bacteria and these minute vegetable cells were found to have an important relation to the health of men and domestic animals, it became necessary to apply the results of bacteriological study to discovery and diagnosis of disease. The work in this department has increased more rapidly than in the chemical. Both have become necessary adjuncts to the work of the State Public Health Service.

Since 1873, the secretary has been professor of sanitary science in the university. In 1893, he was permitted to add these laboratories to this department, and in 1894, the office of the board was removed to St. Paul. In the same year the University gave him permission to fit up some unfinished rooms, one of which has been assigned to the use of the laboratories, the others are used as office and lecture room. The University supplies heat and janitor service, and this board supply chemicals and apparatus, and pays for the service of one assistant in chemistry and one in bacteriology. At this date, Dec. 31, 1894, the laboratories are doing the following regular work:

First — Daily chemical and bacteriological examination of the public water supplies of St. Paul and Minneapolis, and also of other public and private water supplies at the request of local boards of health. See Appendix No. II. water analyses from Oct. 1, 1889, to Jan. 1, 1895.

Second — (a). For health officers and physicians, the examination of membranes or secretions of persons suspected to have diphtheria, by cultivation, staining and the microscope. Boxes prepared for the collection of such material are distributed free of charge. The results of the examination are reported by mail or telegraph, as requested, sometimes immediately, always within twenty-four hours of receipt.

(b). Examination of sputa or tissue for the diagnosis of tuberculosis. Report within a few hours by letter or telegraph, as requested.

(c). Opportunity of instruction and practice in bacteriological diagnosis. For this purpose the facilities are abundant, and applications have been received from health officers and physicians.

Third—The same opportunity is offered to veterinary practitioners who can avail themselves of it, for instruction in the diagnosis and management of glanders, tuberculosis, actinomycosis, trichinosis and other infectious diseases of domestic animals.

Fourth—Instruction is offered to the inspectors of the Bureau of Labor and of local boards of health, in the principles and methods of sanitary inspection for the discovery of and dealing with nuisances, the sanitary supervision of offensive trades, and the inspection of meats.

Fifth—Experiments are making at the bacteriological laboratory, for the production of tuberculin and mallein, which, if successful, will relieve the Bureau of Animal Industry of the present heavy demand for those products for the use of the state and local boards of health.

Sixth—The laboratories are used in the regular undergraduate instruction in the Department of Sanitary Science (Public Health) of the University, and many students are availing themselves of them, for a practical knowledge of the simpler methods of analysis of air, water and food.

Instruction in public health at the university now consists of three courses of lectures with laboratory work.

In the first term of each year, the freshmen class hears lectures upon personal hygiene, with elementary work in air and water analysis, in the chemical laboratory. In the second term the sophomores have lectures upon the hygiene of the home and its relation to the health of the family, with experimental work in the laboratory. In the third term juniors and seniors have instruction in public health from the standpoint of communities and states with more advanced laboratory work. At the end of each course there is a written examination upon the subjects discussed.

By special request, a course of instruction in school hygiene will be offered to students in the university preparing to become teachers in the public schools, during the third term of the present university year, and a special course of lectures and laboratory work for teachers in the common schools will be provided in the summer school of the university in 1895. See programme for last year in Appendix No. IV.

An increasing number of post graduates are making special studies and investigations with reference to future professional work in the direction of public health.

The Vaccine Station at Red Wing grew out of an increasing demand for the supply of pure active and calf lymph by medical men and boards of health. The state board permitted the secretary to begin the work in December, 1890, and provided for its support, till in the early part of 1893 it became self-supporting from the sale of its product, chiefly outside the state. It keeps always on hand at least one

thousand points of vaccine for possible emergency of smallpox in the state, and supplies the state institutions, free of charge. In these ways, it has returned to the state a large proportion of the cost.

Antidoxine of Diphtheria—Without expense to the state, the secretary has begun an experiment for the production of this agent from the horse, at the vaccine station.

In doing this he has followed the example set by the state board of Massachusetts, the Marine Hospital Service and some of the local boards of health of the large eastern cities, where experiments upon a large scale are being supported by large private and public contributions of money. It is not proposed to ask for either in Minnesota till the experiment is successful, and the value of the product for the prevention or cure of diphtheria established.

FINANCIAL STATEMENT—APPENDIX NO. I.

Brings the accounts of the board up to the first of January, 1895. It will be seen that none of the funds of the board have been exhausted, it being an established principle in the administration of the board that no appropriation has ever been overdrawn. The statement is an itemized account, which has been compared and found to agree with the books of the state auditor. So far as my knowledge of the needs of the various departments of the board's work, goes, there is no likelihood of any demand which the present amount of appropriation will not meet, and I therefore suggest that the amounts be left as at present provided.

The appropriations for the use of the board are:

State Board of Health fund.....	\$8,500.00
Infectious diseases of animals fund.....	3,000.00
Vital Statistics fund.....	1,000.00
Contingent fund, in the emergency of cholera.....	15,000.00

In concluding this brief statement of the many forms of activity which have gradually developed in the work of the Public Health Service of Minnesota since its feeble beginning, nearly twenty five years ago, I call attention to the rapid increase of popular interest and co-operation. All classes are participating in the advance, but none more than the agricultural and laboring part of our population, to whom, more than others, health of body is the first essential to self-supporting life. I could supplement my report upon the activity and success of the township boards of health by many proofs of the hearty co-operation and interest of individuals, largely women, mothers of families, health officers of their own homes and helpful to the same end in the neighborhood where they live.

The leading labor organizations of the state are already asking for information and suggestions as to the sanitary needs of their occupation, and how best to promote health in the homes of their members. They are fortunate in having the needful machinery in organization for practical work, so soon as they decide on the course to be taken.

The foundation of public health begins in the healthy homes of the people, and it is there that its greatest victories may be won. From its beginning this board has never ceased efforts in this direction.

There is no mistaking the increasing popular disposition to know more of the means for preserving health, prolonging life, forefending disease and increasing efficiency and happiness, which the Art of Good Health (Hygiene) offers. It is not so much more law and more money which is now required as better knowledge and a demand for sanitary rights, for which the law provides, and which may be had, almost for the asking.

CHARLES N. HEWITT.

ST. PAUL., Jan. 1, 1885.

APPENDIX NO. I.

"STATE BOARD OF HEALTH" FUND—FINANCIAL STATEMENT.

January 1, 1893, to January 1, 1895.

Appropriation Aug. 1, 1892, to Aug. 1, 1893.....		\$5,000.00
Expenses Aug. 1, 1892, to Jan. 1, 1893.....	\$2,025.97	
	<hr/>	
Balance, Jan. 1, 1893.....	\$2,025.97	\$5,000.00
	2,974.03	
	<hr/>	
	\$5,000.00	\$5,000.00
Balance, Jan. 1, 1893		2,974.03
Account of Feb. 15, 1893, for January, 1893.....	222.99	
Account of March 6, 1893, for February, 1893.....	255.34	
Account of April 20, 1893, for March, 1893.....	160.44	
Account of May 22, 1893, for April, 1893.....	290.10	
Account of June 2, 1893, for May, 1893.....	188.03	
Account of July 3, 1893, for June, 1893.....	281.65	
Account of Aug. 5, 1893, for July, 1893.....	116.01	
Secretary's salary, six months.....	1,249.98	
	<hr/>	
	\$2,764.54	
Account of Aug. 5, for July, paid out of appropriation ending July 31, 1892.....	116.01	
	<hr/>	
	\$2,648.53	\$2,974.03
Balance turned over to treasurer, Aug. 1, 1893.....	325.50	
	<hr/>	
	\$2,974.03	\$2,974.03
Appropriation, Aug. 1, 1893, to Aug. 1, 1894.....		8,500.00
Account of Sept. 11, 1893, for August, 1893.....	241.98	
Account of Oct. 5, 1893, for September, 1893.....	197.97	
Account of Nov. 10, 1893, for October, 1893.....	215.57	
Account of Dec. 2, 1893, for November, 1893.....	181.20	
Account of Jan. 5, 1894, for December, 1893.....	242.85	
Account of Feb. 1, 1894, for January, 1894.....	230.34	
Account of March 5, 1894, for February, 1894.....	231.67	
Account of April 3, 1894, for March, 1894.....	244.73	
Account of May 5, 1894, for April, 1894.....	537.62	
Account of June 6, 1894, for May, 1894.....	308.89	
Account of July 10, 1894, for June, 1894.....	396.76	
Account of Aug. 30, 1894, for July, 1894.....	517.79	
Secretary's salary for July, 1893.....	208.33	
Secretary's salary for nine months, at \$2,500.....	1,874.97	
Secretary's salary for three months, at \$3,500.....	874.98	
Secretary's extra salary, from Jan. 10 to May 1, 1894, at \$3,500.....	333.82	
	<hr/>	
	\$6,898.97	
Balanced turned over to treasurer, Aug. 1, 1894.....	1,661.03	
	<hr/>	
	\$8,500.00	\$8,500.00
Appropriation, Aug. 1, 1894, to Aug. 1, 1895.....		8,500.00
Account of Sept. 7, 1894, for August, 1894.....	260.94	
Account of Oct. 8, 1894, for September, 1894.....	267.94	
Account of Nov. 8, 1894, for October, 1894.....	317.05	
Account of Dec. 7, 1894, for November, 1894.....	362.10	
Account of Jan. 17, 1895, for December, 1894.....	596.28	
Secretary's salary, five months.....	1,458.80	
	<hr/>	
	\$3,262.56	
Balance, Jan. 1, 1895.....	5,237.44	
	<hr/>	
	\$8,500.00	\$8,500.00

ITEMIZED STATEMENT "STATE BOARD OF HEALTH" FUND—FINANCIAL STATEMENT.

	Jan. 1, 1893 to Aug. 1, 1893.	Aug. 1, 1893 to Jan. 1, 1894.	Aug. 1, 1894 to Jan. 1, 1895.
Clerks.....	\$341.29	\$730.27	\$366.25
Telegraph and telephone service.....	55.52	136.64	77.71
Books and binding, for library.....	40.12	216.10	30.54
Paper for circulars and blanks.....	74.12	99.40	.....
Laboratory supplies, apparatus and expenses.....	33.07	541.37	488.76
Stationery and supplies for office.....	56.08	167.98	109.98
Express and freight charges.....	20.70	56.26	10.10
Traveling expenses, members of board.....	171.64	140.55	16.50
Fuel.....	20.00	21.00	.....
Lighting.....	9.00	15.00	.....
Postage.....	125.39	173.83	69.42
Printing circulars, special reports and blanks.....	282.09	287.81	9.00
Expenses in control of infectious diseases.....	35.00	95.33	26.00
Rent of office.....	20.00	270.00	300.00
Exhibit at world's fair.....	23.63	18.25	.....
Expenses at vaccine station.....	206.91	80.58	.....
Furniture for new office in St. Paul.....	.....	189.32	.....
Expenses moving office to St. Paul.....	.....	58.13	.....
Expenses, smallpox in La Crescent township.....	.....	243.55	.....
President's salary.....	.....	.....	300.00
Secretary's salary.....	1,249.98	3,291.60	.....
	\$2,764.54	\$6,838.97	\$1,458.30

"INFECTIOUS DISEASES OF ANIMALS" FUND—FINANCIAL STATEMENT.

January 1, 1893, to January 1, 1895.

Appropriation, Aug. 1, 1892, to Aug. 1, 1893.....		\$3,000.00
Expenses from Aug. 1, 1892, to Jan. 1, 1893.....	\$369.63	
	<u>\$369.63</u>	
Balance, Jan. 1, 1893.....	2,630.37	
	<u>\$3,000.00</u>	<u>\$3,000.00</u>

Balance, Jan. 1, 1893.....		2,630.37
Account of Feb. 15, 1893, for January, 1893.....	101.85	
Account of March 6, 1893, for February, 1893.....	108.72	
Account of April 20, 1893, for March, 1893.....	97.56	
Account of May 2, 1893, for April, 1893.....	45.50	
Account of June 2, 1893, for May, 1893.....	83.94	
Account of July 3, 1893, for June, 1893.....	219.61	
Account of Aug. 5, 1893, for July, 1893.....	194.05	
	<u>\$851.23</u>	
Balance, turned over to treasurer, Aug. 1, 1893.....	1,779.14	
	<u>\$2,630.37</u>	<u>\$2,630.37</u>

Appropriation, Aug. 1, 1893, to Aug. 1, 1894.....		3,000.00
Account of Sept. 11, 1893, for August, 1893.....	103.63	
Account of Oct. 5, 1893, for September, 1893.....	110.92	
Account of Nov. 10, 1893, for October, 1893.....	62.83	
Account of Dec. 2, 1893, for November, 1893.....	67.77	
Account of Jan. 5, 1894, for December, 1893.....	57.84	
Account of Feb. 1, 1894, for January, 1894.....	63.35	
Account of March 5, 1894, for February, 1894.....	58.15	
Account of April 3, 1894, for March, 1894.....	108.69	
Account of May 5, 1894, for April, 1894.....	168.16	
Account of June 6, 1894, for May, 1894.....	124.31	
Account of July 10, 1894, for June, 1894.....	65.75	
Account of Aug. 30, 1894, for July, 1894.....	454.63	
	<u>\$1,446.05</u>	
Balance, turned over to treasurer, Aug. 1, 1894.....	1,553.95	
	<u>\$3,000.00</u>	<u>\$3,000.00</u>

Appropriation, Aug. 1, 1894, to Aug. 1, 1895.....		\$3,000.00
Account of Sept. 7, 1894, for August, 1894.....	63.75	
Account of Oct. 8, 1894, for September, 1894.....	80.15	
Account of Nov. 8, 1894, for October, 1894.....	72.60	
Account of Dec. 7, 1894, for November, 1894.....	248.94	
Account of Jan. 17, 1895, for December, 1894.....	168.10	
	<u>\$633.54</u>	
Balance, Jan. 1, 1895.....	2,366.46	
	<u>\$3,000.00</u>	<u>\$3,000.00</u>

ITEMIZED STATEMENT "INFECTIOUS DISEASES OF ANIMALS" FUND.

	Jan. 1, 1893 to Aug. 1, 1893.	Aug. 1, 1893 to Aug. 1, 1894.	Aug. 1, 1894 to Jan. 1, 1895.
Clerks.....	\$328.92	\$477.48	\$151.25
Telegraph and telephone service.....	12.69		
Paper for circulars and blanks.....	74.13	78.47	
Printing circulars, special reports and blanks.....	124.38	140.70	68.60
Stationery and office supplies.....	30.46	20.78	2.05
Express and freight charges.....	3.28	1.45	
Fuel.....		5.50	
Lighting.....		4.50	
Books and binding for library.....	11.85	7.25	
Postage.....	47.20	43.60	18.00
Expenses in control of infectious diseases of animals.....	82.07	426.01	73.75
Rent of office.....	36.00	156.00	150.00
Laboratory supplies, apparatus and expenses.....	49.65	2.00	133.59
Traveling expenses, members of board.....	11.30		36.32
Exhibit at world's fair.....	39.30		
Furniture for new office in St. Paul.....		72.67	
Expenses moving office to St. Paul.....		10.24	
	<u>\$851.23</u>	<u>\$1,446.05</u>	<u>\$633.54</u>

"VITAL STATISTICS" FUND—FINANCIAL STATEMENT.

January 1, 1893, to January 1, 1895.

Appropriation, Aug. 1, 1892, to Aug. 1, 1893.....		\$1,000.00
Expenses from Aug. 1, 1892, to Jan. 1, 1893.....	\$345.72	
Balance, Jan. 1, 1893.....	654.28	
	<u>\$1,000.00</u>	<u>\$1,000.00</u>
Balance, Jan. 1, 1893.....		654.28
Account of Feb. 15, 1893, for January, 1893.....	86.16	
Account of March 6, 1893, for February, 1893.....	76.75	
Account of April 20, 1893, for March, 1893.....	80.88	
Account of May 22, 1893, for April, 1893.....	149.00	
Account of June 2, 1893, for May, 1893.....	71.90	
Account of July 3, 1893, for June, 1893.....	104.74	
Account of Aug. 5, 1893, for July, 1893.....	92.75	
	<u>\$661.15</u>	
Part of account of Aug. 5, for July, paid from appropriation ending July 31, 1894....	11.60	
	<u>\$649.55</u>	
Balance, turned over to treasurer, Aug. 1, 1893.....	4.73	
	<u>\$654.28</u>	<u>\$654.28</u>
Appropriation from Aug. 1, 1893, to Aug. 1, 1894.....		1,000.00
Account of Sept. 11, 1893, for August, 1893.....	82.00	
Account of Oct. 5, 1893, for September, 1893.....	58.30	
Account of Nov. 10, 1893, for October, 1893.....	71.34	
Account of Dec. 2, 1893, for November, 1893.....	69.47	
Account of Jan. 5, 1894, for December, 1893.....	64.17	
Account of Feb. 1, 1894, for January, 1894.....	102.76	
Account of March 5, 1894, for February, 1894.....	86.65	
Account of April 3, for March, 1894.....	92.42	
Account of May 5, 1894, for April, 1894.....	70.00	
Account of June 6, 1894, for May, 1894.....	75.25	
Account of July 10, 1894, for June, 1894.....	67.00	
Account of Aug. 30, 1894, for July, 1894.....	101.09	
Drawn from appropriation, to meet part of account of Aug. 5, 1893, for July.....	11.60	
	<u>\$951.95</u>	
Balance, turned over to treasurer, Aug. 1, 1894.....	48.05	
	<u>\$1,000.00</u>	<u>\$1,000.00</u>

STATE BOARD OF HEALTH.

25

Appropriation, Aug. 1, 1894, to Aug. 1, 1895.....		\$1,000.00
Account of Sept. 7, 1894, for August, 1894.....	91.38	
Account of Oct. 8, 1894, for September, 1894.....	84.25	
Account of Nov. 8, 1894, for October, 1894.....	69.50	
Account of Dec. 7, 1894, for November, 1894.....	75.00	
Account of Jan. 17, 1895, for December, 1894.....	71.00	
	<u>\$391.13</u>	
Balance, Jan. 1, 1895.....	608.87	
	<u>\$1,000.00</u>	<u>\$1,000.00</u>

ITEMIZED STATEMENT "VITAL STATISTICS" FUND.

	Jan. 1, 1893 to Aug. 1, 1893.	Aug. 1, 1893 to Aug. 1, 1894.	Aug. 1, 1894 to Jan. 1, 1895.
Clerks.....	\$427.51	\$686.00	\$310.00
Printing circulars, special reports and blanks.....	16.53	39.05	13.13
Stationery and office supplies.....	10.43	9.20	.....
Express and freight charges.....	16.68	25.68	.....
Postage.....	165.00	162.50	68.00
Office rent.....	14.00	18.00	.....
Exhibit at world's fair.....	11.00	.....	.....
	<u>\$661.15</u>	<u>\$940.35</u>	<u>\$391.13</u>
Part of account of August 5, for July, 1893		11.60	
		<u>\$951.95</u>	

APPENDIX NO. II. WELL WATERS.

(Sent for analysis on suspicion of impurity.)

Results Expressed in Parts per 100,000, Multiplied by .584, give Grains per American Gallon.

WHERE TAKEN.	Page of Record	Date.	SOLIDS.		Nitrites.	Nitrates.	Chlorine.	Oxygen Consumed.	AMMONIA.		HARDNESS.		Alkalinity.	REMARKS.
			Total.	Volatile					Free.	Albuminoid.	Temporary.	Permanent.		
Duluth.....	321	10-13-94	52.5	12	Marked.....	Marked.....	4.221	.6020	.074	.023	14	26	40	51.1
Duluth.....	322	10-13-94	18.5	3	Trace.....	Trace.....	.938	.2462	.008	.005	8	12	20	14.4
Duluth.....	323	10-14-94	54.5	3	Trace.....	Trace.....	1.032	.1184	.020	.003	16	20	36	50
Duluth.....	324	10-17-94	74.5	27	Trace.....	Trace.....	7.504	.2368	.0015	.017	14	29.4	43.4	40
Duluth.....	325	10-18-94	41.5	4	None.....	None.....	.3752	.0987	.016	.003	13.8	22.4	36.2	60
Duluth.....	326	10-22-94	36	9	Strong.....	Trace.....	.5628	.3998	.021	.008	8	20	28	42
Duluth.....	327	11-5-94	33	19	Strong.....	Trace.....	4.69	.6962	.116	.026	3	13	16	6
Duluth.....	328	11-5-94	33	6.5	Trace.....	Strong.....	3.564	.5773	.010	.011	10	12	22	23
Duluth.....	329	11-6-94	23	4.5	Strong.....	Strong.....	.5628	.2417	.021	.011	6	18	24	12
Duluth.....	330	11-6-94	10.5	3.5	Distinct.....	Trace.....	.3752	.3109	.032	.011	2	7	9	10
Duluth.....	341	1-7-94	10.5	2	Trace.....	Trace.....	.1976	.4342	.007	.006	6.6	2.4	9	6
Duluth.....	342	11-9-94	35	11	Trace.....	Trace.....	.2814	.2867	.004	.0075	4	28	32	40
Total.....			437.8	104.5			24.304	4.2489	.3305-	.1375	105.4	211.2	315.6	344.5
Average.....			36.4	8.7			2.0253	.3154	.0275	.0114	8.783	17.6	26.3	28.7
Av. 5 good wells.....			30.4	4.7			.452	.2497	.0158	.0041	8.28	15.9	24.4	31.2
Milaca.....	330	10-25-94	43	11	Trace.....	None.....	1.688	.4046	.000	.018	2	23	25	30
Milaca.....	331	10-25-94	29.5	7	Trace.....	Trace.....	.5628	.7469	.0120	.0190	9	25	34	32
Milaca.....	332	10-26-94	22.5	3	Trace.....	Trace.....	.3752	.3958	.0300	.0160	16	14	30	24
Milaca.....	333	10-26-94	22	6	Trace.....	Trace.....	.4698	.4003	.0070	.0130	6	15	21	15
Milaca.....	334	10-27-94	38	9	Trace.....	Trace.....	.3283	.7007	.0000	.0060	7.4	13	20.4	43
Milaca.....	335	10-27-94	39.2	6.5	Strong.....	Strong.....	3.189	1.222	.0035	.0115	6	14	20	17
Total.....			194.2	42.5			6.6131	2.7705	.0525	.0835	65.4	104	150.4	161
Average.....			37.2	7			7.500	.4617	.0131	.0139	10.9	17.3	25.0	26.8
Shakopee.....	232	11-22-93			Strong.....	Strong.....								Bad.
Faribault.....	201	4-3-98	60	16	Strong.....	Strong.....								Good.
Northfield.....	220	10-25-93			Trace.....	Trace.....	1.950		.0000	.0030				Good.
Northfield.....	226	11-11-93			Trace.....	Trace.....	.4000		.0055	.0065				Good.
Northfield.....	227	11-11-93			Distinct.....	Strong.....	2.000		.0005	.0055				Good.
Northfield.....	315	10-2-94	31	5	Small trace.....	Trace.....	.1876	.049	.0140	.0020	15	15.2	30.2	40
Northfield.....	316	10-2-94	36.5	10	Small trace.....	Strong.....	.938	.0884	.0010	.0014	6.4	18	34.4	34.6
Northfield.....	317	10-2-94	34	6.3	Small trace.....	Trace.....	.3752	.0247	.0130	.0014	16.4	18	35.4	33
Northfield.....	318	10-2-94	28	8.2	Small trace.....	Strong.....	.7504	.0354	.0035	.0010	12.6	8	20.6	20
Northfield.....	319	10-1-94	28.2	5	Small trace.....	Trace.....	.938	.0691	.0005	.0077	18.	18	36	40
Northfield.....	320	10-1-94	33	13	Strong.....	Strong.....	1.500	.0247	.0010	.0020	1.7	26.1	27.8	46
Total.....			170.7	47.8			7.284	.2903	.0395	.0301	70.5	113.5	185.4	213.6
Average.....			28.4	7.96			.8093	.0483	.0049	.0033	11.7	18.9	30.9	35.6
Av. 7 good wells.....			37.04	5.5			.5782	.0414	.003	.0042	16.4	14.6	31	31

Red Wing, Av. 12 good wells.....	42.1	{ 11.8 (10)	.....	.....	{ 1.198 (10)	.....	{ .008 (5)	{ .0062 (5)	{ 11.0 (5)	{ 11.6 (5)	{ 15.9 (10)	17.50	Good. Good.
Lake City.....	275	.....	None	Trace	.3752	.0312	.002	.001	.....	.....	.....	.....	.....
Lake City.....	276	.....	None	Trace	.469	.0312	.001	.002	.....	.....	.....	.....	.....
Total.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Av. 3 good wells.....	{ 41.6 (1)	{ 16.8 (1)	.....	.....	.8442	.0624	.003	.003	.....	.....	.....	.....	.....
Winona.....	202	8-15-93	Strong	Strong	.4221	.0312	.0015	.0015	.....	.....	.....	.....	.....
Winona.....	204	8-15-93	Strong	Strong	.548	.0312	.0033	.0025	.....	.....	.....	.....	.....
Winona.....	205	8-24-93	Distinct	Distinct	.....	.....	.....	.....	.....	.....	.....	.....	.....
Winona.....	206	8-24-93	Distinct	Distinct	.....	.....	.....	.....	.....	.....	.....	.....	.....
Winona.....	207	8-24-93	Strong	Strong	.....	.....	.....	.....	.....	.....	.....	.....	.....
Winona.....	208	8-24-93	Distinct	Distinct	.....	.....	.....	.....	.....	.....	.....	.....	.....
Winona.....	209	8-24-93	Distinct	Distinct	.....	.....	.....	.....	.....	.....	.....	.....	.....
Winona.....	210	8-24-93	Distinct	Distinct	.....	.....	.....	.....	.....	.....	.....	.....	.....
Winona.....	303	9-13-94	None	Trace	.....	.....	.....	.....	.....	.....	.....	.....	.....
Winona.....	304	9-13-94	Trace	Trace	.....	.....	.....	.....	.....	.....	.....	.....	.....
Winona.....	305	9-13-94	Trace	Trace	.....	.....	.....	.....	.....	.....	.....	.....	.....
Winona.....	306	9-13-94	Trace	Strong	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	217.5	107.5	.....	.....	28.27	.8746	.1875	.0588	26.4	77.2	123.6	87	.....
Av. 13 good wells.....	28.1	13.4	.....	.....	2.36	.2183	.156	.057	6.6	19.3	30.9	21	.....
.....	28.2	7.17	.....	.....	1.88	.163	.009	.0022	{ 11.6 (4)	{ 7.25 (4)	{ 15.07 (11)	{ 18.5 (4)	Good.
Rochester.....	289	8-30-94	.....	Trace	.656	.175	.050	.0010	.....	.....	.....	.....	.....
Rochester.....	315	10-10-94	Distinct	Strong	5.628	.1224	.0050	.0105	32.6	32.4	18	39	Good. Bad.
Total.....	153	52.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Av. 4 good wells.....	47.5	26.2	.....	.....	6.284	.2974	.0120	.0115	32.6	32.4	88	39	.....
.....	.....	5.12	.....	.....	3.142	.1487	.0060	.0057	32.6	32.4	41	39	.....
Elysian.....	291	8-23-94	.....	Trace	.0938	.0587	.0054	.0016	.....	.....	.....	.....	.....
.....	32	8.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Austin.....	293	3-8-94	Trace	Small trace	.400	.....	.0020	.0115	.....	.....	.....	.....	.....
Albert Lea.....	214	8-25-93	Strong	Strong	22.5	.....	.0000	.0050	.....	.....	.....	.....	.....
Av. 7 good wells.....	121	{ 42.6 (7)	.....	.....	.60	.06	.0049	.0051	30.5	9.1	25.08	.....	.....
Mankato.....	218	10-16-93	Trace	Trace	.4875	.....	.000	.0055	{ 2 (2)	{ 9.1 (2)	{ 25.08 (5)	.....	.....
Mankato.....	219	10-18-93	Trace	Trace	.6825	.....	.....	.....	.....	.....	.....	.....	.....
Mankato.....	296	9-14-94	Trace	None	4.62	.109	.0200	.0040	.....	.....	.....	.....	.....
.....	.....	13.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	45	Good. Bad.

WELL WATERS — Continued.

WHERE TAKEN.	Page of Record Book.	Date.	SOLIDS.		Nitrites.	Nitrates.	Chlorine.	Oxygen Consumed.	AMMONIA.		HARDNESS.		Alkalinity.	REMARKS.
			Total.	Volatile					Free.	Albumino d.	Temporary.	Permanent.			Total.
Mankato	297	9-14-94	40	8	Trace	Trace	3.56	.454	.0280	.0550	24	Bad. Good. Suspicious.
Mankato	298	9-20-94	45	10	Trace	Trace	.938	.1123	.001	.015	.....	.....	23.6
Mankato	302	9-13-94	28.5	12	None	Trace	1.595	.1598	.000	.006	21	20.6	41.6	
Total			275.5	55			11.8830	.8351	.0490	.0855	21	20.6	117.2	Good.
Average			45.9	9.1			1.9805	.2087	.0163	.0171	21	20.6	29.3	
Av. 10 good wells			47.8	{ 5.16 (9)			.5307	{ .0877 (3)	.0021	{ .0095 (6)			{ 16.9 (6)	
St. Peter	211	8-27-93	90.5	15	Strong		5.000		.0360	.0060				Bad. Bad.
St. Peter	212	8-29-93	96.7				3.000		.0450	.0040				
Total			187.2	15			8.000		.0810	.0100				
Average			93.6	15			4.000		.0405	.0050				Good.
Av. 3 good wells			{ 35.7 (2)	{ 7.3 (2)	{ .005 (2)		2.12	{ .072 (3)	.0032	.0031			{ 23 (2)	
Winthrop	224	10-30-93			Strong	Very marked	1.500			.0140				
Winthrop	228	11-13-93			Trace	Marked	2.690		.0020	.0255				
Winthrop	229	11-17-93			Trace	None	2.200		.186	.0080				
Winthrop	230	11-17-93			Trace	Trace	.200		.0640	.0000				
Total							3.900		.0776	.0475				
Average							.997		.0258	.0158				
Gaylord	240	2-5-94	28.1	7.4	Trace	Trace	4.000		.0045	.0025				Suspicious. Bad. Suspicious.
Gaylord	241	2-5-94	213.7	86	Trace	Trace	60	.071	.0020	.0070			11.4	
Gaylord	242	2-5-94	110.7	29	5.53	Marked	14	1.450	.0045	.0070			16	
Gaylord	243	2-5-94	56.7	3.4	Trace	Marked	1.9	.064	.0025	.0115			17	Suspicious. Suspicious. Bad.
Gaylord	244	2-5-94	153.2	86.7	Strong	Marked	8.8	.0333	.0030	.015			17	
Gaylord	245	2-5-94	54.2	2.05	Trace	Marked	17.5		.0070	.0020			17	
Total			616.6	214.55			106.2	1.5883	.0235	.0315			61.4	
Average			102.7	35.75			17.7	.3971	.0034	.0052			12.2	
Worthington	312	9-24-94	46.5	8	None	Trace	.5628	.3256	.0030	.0120	13.0	23.4	36.4	Good. Good.
Worthington	313	9-24-94	47	6	None	Trace	.2814	.3849	.0070	.0310	14.6	25.4	40	
Total			93.5	14			.8442	.7105	.0100	.0430	27.6	48.4	76.4	
Average			46.7	7			.4221	.3552	.0050	.0215	13.8	24.2	38.2	47
													33.5	
Minnesota	231	4-8-94	167	35	Trace	Trace	37.50		.0000	.0070				Bad. Suspicious. Suspicious.
Minnesota	235	4-8-94	90	8	Trace	Distinct	3.80		.0000	.0020				
Minnesota	236	4-8-94	145	10.5	Trace	Faint trace	.800		.0560	.0050				

[illegible]

WELL WATERS—Continued.

WHERE TAKEN.	Page of Record Book.	Date.	SOLIDS.		Nitrites.	Nitrates.	Chlorine.	Oxygen Consumed.	AMMONIA.		HARDNESS.	Alkalinity.	REMARKS.
			Total.	Volatile					Free.	Albuminoid.	Temporary.	Permanent.	
Howard Lake...	327	10-23-94	76.5	14	Trace	Marked	7.035	.4689	.003	.0105	23	18	41
Howard Lake...	328	10-24-94	43.5	8.5	Trace	Trace	.8392	.2073	.004	.003	12	18	30
Howard Lake...	329	10-24-94	63.5	9	Trace	Trace	.1976	.1529	.007	.005	3.7	24.9	28.6
Total			183.5	31.5			8.003	.8201	.014	.0185	38.7	60.9	99.6
Average			61.1	10.5			2.6801	.2763	.004	.0031	12.9	20.3	33.2
†Minneapolis...			48	8.5	None.	Distinct.	.826	.1018	.007	.0015			{ 29.4
Minneapolis...	310	9-20-94	32	8.5	None.	Trace.	.2814	.0494	.006	.0045	10.6	20.4	{ 31
Av. 5 good wells			30.8	6.7	Small trace.	Small trace.	{ .476	{ .372	{ .006	{ .0045	{ 15.5	{ 10.6	{ 26.8
							{ (4)	{ (1)	{ (1)	{ (1)	{ (4)	{ (4)	{ (2)
													{ 36
													{ 36
													{ (1)
													{ (1)

† Spring on the State University Campus, Av. 4 analyses.

See averages of good, suspicious, and bad well waters after artesian waters page 32.

ARTESIAN WELLS.

Results Expressed in Parts per 100,000, Multiplied by .584, Give Grains per American Gallon.

WHERE TAKEN.	Page of Record Book.	Date.	Depth.	SOLIDS.		Nitrates	Chlo- rine.	Oxygen Con- sumed.	AMMONIA.		HARDNESS.		Alka- linity	REMARKS.
				Total.	Volatile				Free.	Albu- minoid.	Tem- perary.	Perma- nent.		
Stillwater.....	122	7-6-89	3,000	23.5	4.5	.....	.572	.0144	.0032	.000	17	3	20	Good.
St. Paul.....	149	8-6-90	360	26	2	None	.473	.....	.....	.....	.....	.....	.....	Good.
St. Paul.....	256	5-30-94	.....	19.9	6	None	.1578	.....	.005	.005	.....	.....	.....	Good.
Total.....				45.9	8	.....	.6308	.....	.005	.005	.....	.....	.....
Average.....			360	22.9	4	.....	.3154	.....	.0245	.0025	29.5	9.06	35.2	
Av. 6 good artesian wells.				25.3	3.8	.....	.448 (5)	.034	{.0245 (3)}	{.0025 (3)}	{29.5 (3)}	{9.06 (5)}	{35.2 (4)}	
Northfield.....	5	11-28-87	137 ft.	37.5	5.1	Trace	.4000	.0502	.0005	.0025	7.2	14.8	22	Good.
Northfield.....	288	8-29-94	88	38	8.5	Trace	.469	.1758	.0010	.0050	8.2	15.8	24	Good.
Northfield.....	301	9-13-94	315	38	8.5	Trace	.284	.167	.0520	.0030	.....	.....	40	Good.
Total.....			540	75.5	13.6	.....	1.153	.3127	.0535	.0105	15.4	30.6	46	
Average.....			180	37.7	6.8	Sm'tr'ce	.351	.1142	.0178	.0035	7.7	15.3	23	40
Owatonna.....	26	11-25-87	127	41	.....	Trace	.4000	.0366	.0135	.0010	.....	.....	.....	Good.
Owatonna.....	158	10-6-90	600	38	7	.....	.284	.....	.....	.....	.....	.....	.....	Good.
Total.....			727	79	.....	Trace	.6840	.0366	.0135	.0010	.....	.....	.....
Average.....			353.5	39.5	7	Trace	.3420	.118	{.0143 (3)}	{.0033 (3)}	{15.9 (3)}	{4.8 (2)}	{20.8 (2)}	24
Av. 5 good artesian wells.				40.7	{6.9 (3)}	{.3 (3)}	{.476 (3)}	{.118 (4)}	{.0143 (3)}	{.0033 (3)}	{15.9 (3)}	{4.8 (2)}	{20.8 (2)}	{24 (1)}
Red Wing.....	87	5-17-89	400	44	2	Trace	10.48	.0094	.025	.0005	6.5	17	28	15
Red Wing.....	269	6-19-94	430	28	5.5	Trace	3.01	.0320	.0030	.0030	6.5	17	23.5	30
Red Wing.....	271	6-19-94	.....	45.9	6	Trace	5.675	.0340	.0030	.0030	8.8	17	25.8	30
Red Wing.....	134	8-20-89	300	35.4	.....	.005	4.200	.0144	.0040	.0000	.....	.....	28	30
Red Wing.....	135	8-20-89	553	39	.....	.002	9.200	.0192	.0170	.0000	.....	.....	23.2	24
Red Wing.....	136	8-22-89	*370	30.4	.....	.000	Trace	.4128	.0002	.0053	.....	.....	23	26
Red Wing.....	137	8-29-89	1470	40.	11	None	2.2	.9024	.002	.019	.....	.....	26	26
Total.....			2,523	262.7	24.5	Trace	38.755	1.3580	.1552	.0338	15.3	34	177.5	191
Average.....			420.5	37.5	6.12	Sm'tr'ce	5.251	.2716	.0222	.0048	7.65	17	26.35	27.3
Av. 27 good artesian wells.				37.6	3.5	.....	5.86	.126	{.0127 (2.5)}	{.0044 (5)}	{8.23 (1.0)}	{9.54 (1.0)}	{21.3 (2.4)}	{27.3 (7)}
Mankato.....	8	8-9-87	.....	50	5	.022	.25	.0183	.1483	.0022	1.8	16	34	32
Mankato.....	118	7-5-89	650	57	.....	None	.7624	.0234	.0890	.0000	.....	.....	.....	Good.
Total.....			107	107	10	.022	1.0124	.0722	.2288	.0022	.....	.....	.....

Average	650	53.5	5	.022	None ..	.5062	.0361	.1144	.0011	18	16	34	32
Av. 10 good artesian wells...		{ 48.5 (5)	{ 8 (8)			.539	{ .0690 (5)	{ .0052 (7)	{ .0012 (7)	{ 17.9 (7)	{ 6.9 (7)	{ 23.5 (9)	{ 32 (2)
Crookston.....	53	6.7-88		Strong..	Trace ..	13.000	.1643	.056	.003				Good.
Average 2 wells.....		54	6.9			13	.1643	.0291	.005				
Mapleton.....		97.5		Sm. tr'ce	None ..	.4000	.1248	.0840	.0020			51	44
Centerville lake.....	284	8-27-94	4.5	None ..	Trace ..	.1409		.0050	.0020			26.4	42
Vadnais ..	280	8-27-94		Trace ..	Trace ..	.1407	.0672	.056	.002			44	29
Vadnais ..	346	11-26-94		Trace ..	None ..	.2844	.1023	.038	.006			31	37
Vadnais ..	345	11-27-94		Trace ..	Fl. trace	.0938	.0731	.048	.010			15	33
Total		86	17.5			.5189	.2436	.142	.018	32.4	29	105.4	99
Average.....		28.7	5.83	Trace ..	Sm. tr'ce	.1729	.08687-	.0473	.0056	16.2	14.5	31.8	33
Av. 23 good artesian wells..		34.99	5.95			.5116	{ .1874 (1)	{ .1365 (2.1)	{ .0036 (2.1)	{ 12.5 (8)	{ 13.7 (8)	29.4	32
General average for artesi an wells in thestate		{ 41.85 (10)	{ 5.63 (3.3)			{ 1.52 (7.6)	{ .125 (6)	{ .0207 (4.8)	{ .0042 (4.7)	{ 16.8 (4.0)	{ 7.64 (4.0)	{ 26.2 (3.3)	{ 30.4 (2.1)

* Drilling; † Same well; ‡ Flowing.

AVERAGE OF WELL WATERS.

For details see page 26.

Results Expressed in parts per 100,000, Multiplied by .584 gives Grains per American Gallon.

	SOLIDS.		Nitrites.	Nitrates.	Chlo- rine.	Oxygen Con- sumed.	AMMONIA.			HARDNESS.		Alka- linity.
	Total.	Volatile					Free.	Albu- minoid.	Tempo- rary.	Perm- anent.	Total.	
Good Wells.....	39.2	7.79				.1313	.0063	.0116	16.6	9.94	20.4	19.9
190 Analyses.....	(15.0)	(14.5)	.0041		1.089	(8.5)	(12.3)	(12.1)	(4.5)	(4.5)	(12.4)	(22)
Suspicious Wells. ...	56.6	13.9	.139	.301	3.135	.2202	.0154	.0104-	12.3	10.04	20.8	21.9
134 Analyses.....	(10.4)	(11.2)	(1.4)	(2)	(13.4)	(6.7)	(11.6)	(11.6)	(3.4)	(3.4)	(8.8)	(16)
Bad Wells.....	77.54	23.9	.25		9.56	.6102	.0252	.0181	17.5	14.7	25.5	26.2
161 Analyses.....	(11.2)	(10.1)	(1)		(13.6)	(5.8)	(11.3)	(11.2)	(3.4)	(3.4)	(8.9)	(12)

LAKE WATERS. (ST. PAUL WATER SUPPLY.)

Results Expressed in Parts per 100,000, Multiplied by .684, give Grains per American Gallon.

WHERE TAKEN.	Page of Record Book	Date.	SOLIDS.		Nitrites.	Nitrates.	Chlorine.	Oxygen Consumed.	AMMONIA.		HARDNESS.	Alkalinity.	REMARKS.
			Total.	Volatile					Free.	Albuminoid.	Temporary.	Permanent.	
Yadnais lake....	279	8-29-94	14.5	6	Trace	Trace	.1976	.487	.0015	.0480	Good.
Av 5 analyses...	.....	.....	20.9	5.4	.....	.....	.1755	.315	{ .0017 (2)	{ .027 (2)	{ 11.6 (3)	{ 4.03 (3)
Pleasant lake ..	281	8-27-94	14.5	5.5	None	Trace	.1876	.681	.0014	.0500	.....	.....
*Baldwin lake...	334	11-28-94	17	5	Trace	Trace	.1876	.819	.0820	.0580	12	12	Good.
*Baldwin lake..	282	8-24-94	19	6	None	Trace	.2844	.864	.0060	.067	6.6	10.4	
Total .....	.....	.....	36	11	.....	.....	.....	.....	.0380	.1200	18.6	22.4
Average	18	5.50190	.0660	9.3	11.2	Bad. Swampy.
*Centerville....	283	8-27-94	27.2	4.2	None	Trace	.1409	.885	.0030	.1500	2.6	12.4	
*Centerville....	347	11-28-94	20	6	Trace	Trace	.1876	.7093	.0360	.0540	7	15	
Total	47.2	10.20390	.2040	9.6	27.4	Good.
Average .....	.....	.....	23.6	5.1	.....	.....	.....	.....	.0195	.1020	4.8	13.7
W.Okabena lake	313	9-24-94	47	6	None	Trace	.2814	.3849	.067	.031	14.6	25.4	
St. Paul supply	Good.
Av. 154 analyses	.....	.....	18.2	4.9	Faint trace.	Trace	.2478	.459	.003	.029	9.8	4.2

* Examined with reference to public use.

† They are affected by adjacent low overflowed land.

† Daily analyses of Lake Yadnais water.

APPENDIX NO. III.

TABLE SHOWING DISTRIBUTION AND DISPOSAL OF ANIMALS SUSPECTED AND ISOLATED FOR GLANDERS, 1893 AND 1894.

LOCALITY.	1893.					1894.				
	Cases.	Killed.	Died.	Released.	Remaining.	Cases.	Killed.	Died.	Released.	Remaining.
ANOKA COUNTY—										
Ramsey township.....						1	1			
BECKER COUNTY—										
Detroit (village).....	2	2								
Audubon township.....						2	1		1	
Audubon (village).....						3	1		2	
Walworth township.....						1	1			
BIG STONE COUNTY—										
Prior township.....						1			1	
BLUE EARTH COUNTY—										
McPherson township.....						1			1	
Mankato (city).....						1	1			
BROWN COUNTY—										
New Ulm (city).....	4	4								
CHIPPEWA COUNTY—										
Louriston township.....						5	3			2
CLAY COUNTY—										
Kertz township.....	3	3								
Elmwood township.....	4	4								
COTTONWOOD COUNTY—										
Windom (village).....	12	9		3						
Delton township.....	1	1								
Rose Hill township.....						4	4			
Westbrook township.....						2	2			
CROW WING COUNTY—										
Brainerd (city).....	2	2								
Unorganized township.....	2	2								
DAKOTA COUNTY—										
Inver Grove township.....						1			1	
Alexandria (village).....	1	1								
Hudson township.....						1		1		
Lund township.....						2			2	
FILLMORE COUNTY—										
Spring Valley township.....	1	1								
Jordan township.....	1	1								
Chatfield township.....	1	1								
FREEBORN COUNTY—										
Oakland township.....	4	3		1						
Moscow township.....	4	4				1	1			
London township.....						1			1	
GRANT COUNTY—										
Erdahl township.....	1	1								
Lein township.....	1	1				8	8			
Elbow Lake (village).....						2			2	
HENNEPIN COUNTY—										
Eden Prairie township.....	1	1								
Minneapolis (city).....						11	8		3	
HUBBARD COUNTY—										
Straight Prairie township.....						2				2
JACKSON COUNTY—										
Lakesfield (village).....	1	1								
Petersburgh township.....	4	3		1		1			1	
Heron Lake township.....	1	1								
La Crosse township.....	2	2								
Heron Lake (village).....	1	1				1		1		
KITTSOON COUNTY—										
Skone township.....	1	1								
Hazelton township.....	4	1		3						
Ross township.....						1				1
Jadis township.....						1				1
LAC QUI PARLE COUNTY—										
Hamlin township.....	1	1								
LE SUEUR COUNTY—										
Waterville (village).....	1			1						
LINCOLN COUNTY—										
Ash Lake township.....	2	2								
Marshfield township.....						7	3		4	

GLANDERS, 1893 AND 1894 — *Continued.*

LOCALITY.	1893.					1894.				
	Cases.	Killed.	Died.	Released.	Remaining.	Cases.	Killed.	Died.	Released.	Remaining.
LYON COUNTY—										
Custer township.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....
Monroe township.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....
Island Lake township.....	.....	.....	.....	.....	.....	2	2	.....	.....	.....
Minneota (village).....	.....	.....	.....	.....	.....	3	.....	.....	3	.....
Marshall (village).....	.....	.....	.....	.....	.....	1	.....	.....	1	.....
MCLEOD COUNTY—										
Round Grove township.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....
MARSHALL COUNTY—										
Bloomer township.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Augsberg township.....	10	3	.....	7	.....	2	2	.....	.....	.....
Alma township.....	.....	.....	.....	.....	.....	2	2	.....	.....	.....
Marsh Grove township.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1
MEEKER COUNTY—										
Collinwood township.....	5	3	.....	2	.....	.....	.....	.....	.....	.....
Cedar Mill township.....	.....	.....	.....	.....	.....	2	.....	.....	2	.....
Danielson township.....	.....	.....	.....	.....	.....	5	.....	.....	5	.....
MILLE LACS COUNTY—										
Bergholm township.....	.....	.....	.....	.....	.....	2	2	.....	.....	.....
MORRISON COUNTY—										
Belle Prairie township.....	2	1	.....	1	.....	.....	.....	.....	.....	.....
Pierz township.....	.....	.....	.....	.....	.....	3	.....	.....	.....	3
MOWER COUNTY—										
Austin (city).....	2	1	.....	1	.....	5	3	.....	2	.....
Windom township.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....
MURRAY COUNTY—										
Iona township.....	6	2	2	2	.....	.....	.....	.....	.....	.....
Dovray township.....	8	2	1	5	.....	.....	.....	.....	.....	.....
Line Lake township.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....
NOBLES COUNTY—										
Lorain township.....	2	1	.....	.....	.....	.....	.....	.....	.....	.....
Elk township.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Worthington (village).....	13	7	.....	6	.....	.....	.....	.....	.....	.....
Bigelow township.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....
OLMSTED COUNTY—										
Pleasant Grove township.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....
ORFÈRE TAIL COUNTY—										
Paddock township.....	3	1	.....	2	.....	.....	.....	.....	.....	.....
Homestead township.....	2	2	.....	.....	.....	.....	.....	.....	.....	.....
Gorman township.....	.....	.....	.....	.....	.....	2	2	.....	.....	.....
PIPESTONE COUNTY—										
Grange township.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Aetna township.....	.....	.....	.....	.....	.....	13	1	.....	12	.....
Sweet township.....	.....	.....	.....	.....	.....	3	1	.....	2	.....
POLK COUNTY—										
Terrebonne township.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1
Sandsville township.....	.....	.....	.....	.....	.....	3	.....	.....	3	.....
REDWOOD COUNTY—										
Sheridan township.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Delhi township.....	.....	.....	.....	.....	.....	4	4	.....	.....	.....
Kintire township.....	.....	.....	.....	.....	.....	7	7	.....	.....	.....
RENVILLE COUNTY—										
Norfolk township.....	2	2	.....	.....	.....	.....	.....	.....	.....	.....
Preston Lake township.....	.....	.....	.....	.....	.....	3	2	.....	1	.....
Boon Lake township.....	.....	.....	.....	.....	.....	10	3	.....	.....	7
Buffalo Lake (village).....	.....	.....	.....	.....	.....	2	1	.....	.....	1
SHERBURNE COUNTY—										
Big Lake township.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Palmer township.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....
SIBLEY COUNTY—										
Henderson township.....	2	2	.....	.....	.....	.....	.....	.....	.....	.....
STEVENS COUNTY—										
Pepperton township.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....
SWIFT COUNTY—										
Marysland township.....	1	.....	.....	1	.....	2	2	.....	.....	.....
TODD COUNTY—										
Hartford township.....	2	1	.....	1	.....	.....	.....	.....	.....	.....
Villard township.....	3	.....	3	.....	.....	.....	.....	.....	.....	.....

GLANDERS, 1893 AND 1894—Continued.

LOCALITY.	1893.					1894.				
	Cases.	Killed.	Died.	Released.	Remaining.	Cases.	Killed.	Died.	Released.	Remaining.
TRAVERSE COUNTY—										
Browns Valley (village).....	1	1				1			1	
Wheaton (village).....										
WABASHA COUNTY—										
Oakwood township.....	6	6								
WADENA COUNTY—										
Aldrich township.....						1			1	
WASECA COUNTY—										
Freedom township.....						2	1		1	
Janesville township.....						1	1			
WASHINGTON COUNTY—										
Stillwater (city).....	1	1								
Baytown township.....	1	1								
Stillwater township.....	1			1						
WATONWAN COUNTY—										
St. James township.....	2	2								
Madellia township.....	1	1								
Antrim township.....						2			2	
WILKIN COUNTY—										
Deerborn township.....	1	1								
Breckenridge township.....						4	4			
WRIGHT COUNTY—										
Chatham township.....						3	1		2	
Howard Lake (village).....						1	1			
Middleville township.....						2	2			

GENERAL STATISTICS OF GLANDERS, 1893-1894.

Summary for 1893.—Dec. 1, 1892, to Jan. 1, 1894.

Counties invaded.....	35
Localities invaded.....	64
Number suspected horses isolated.....	189
Horses killed.....	131
Number of horses died.....	6
Number of animals released.....	52
Number remaining unaccounted for.....	0

Summary for 1894.—January-December.

Counties invaded.....	43
Localities invaded.....	82
Number suspected horses isolated.....	295
Number horses killed.....	176
Number horses died.....	8
Number horses released.....	83
Number horses remaining.....	28

GLANDERS.

THE STATISTICS OF THE USE OF MALLEIN

FOR THE DIAGNOSIS OF GLANDERS IN HORSES FOR THE YEARS 1893-94
INCLUDING THERMOMETRIC TESTS AND POSTMORTEM RECORDS.

The greatest difficulty in the discovery of the existence of glanders is the fact, that in many cases its symptoms are so obscure as not to be noticeable, or, when discovered, so closely resemble those of other harmless and curable diseases that owners are not alarmed, and veterinarians are misled.

Very many of the outbreaks of this disease have been traced to such cases whose existence was not suspected until they had infected many of the animals associated with them.

This difficulty has been long recognized and some means of certain diagnosis earnestly sought. Within the last three years, Mallein, a product from the specific cause of glanders, has been thoroughly tested in Europe and America upon many thousand horses and submitted to the severest trial. It is now conceded that, if used in a proper way, which, fortunately, is not a difficult one, its evidence is thoroughly reliable, and post-mortem examination of animals condemned by its use prove its reliability.

The Bureau of Animal Industry of the Department of Agriculture, after testing it thoroughly, began its production and for two years have honored all the requisitions that the Secretary of the State Board of Health has made for free distribution to the local boards of health.

It has been used under the direction of the state and local boards in 164 animals up to the 1st of January, 1895. Of that number, 98 have been killed on the testimony of Mallein and the professional examination by a veterinarian; 64 have been released.

These animals were distributed in thirty-nine localities and twenty-nine counties. In ten counties there were two outbreaks and in nineteen, one each.

Mallein has won the confidence, not only of the health officers and veterinarians, but of the owners of the animals tested, as is proved by the number of applications for it, for their own use.

The data bracketed in Augusberg township and Worthington village are records of reinjections in the same animal.

Chippewa.	Granite Falls twp	9-14 15	9-12-94 2 p.m. 99.5	9-12-94 5 p.m. 100	9-13-94 9 a.m. 102	9-13-94 6 p.m. 99	9-13-94 9-13-94 6 p.m. 102	9-14-94 7 a.m. 102	9-14-94 11 a.m. 99	9-14-94 3x2 inches; 4 p.m. disappeared 99	No symptoms; was released.
			9-12-94 2 p.m. 99.5	9-12-94 5 p.m. 101	9-13-94 9 a.m. 102	9-13-94 11 a.m. 103	9-13-94 6 p.m. 102	9-13-94 6 p.m. 102	9-14-94 8 a.m. 101	9-14-94 2x2 inches; 11 a.m. disappeared 96	No symptoms; was released.
			9-12-94 2 p.m. 100	9-12-94 5 p.m. 100	9-13-94 9 a.m. 102	9-13-94 11 a.m. 102	9-13-94 6 p.m. 102	9-13-94 6 p.m. 102	9-14-94 8 a.m. 101.5	9-14-94 2x2 inches; 11 a.m. disappeared 99.5	No symptoms; was released.
			9-12-94 2 p.m. 99	9-12-94 5 p.m. 101	9-13-94 9 a.m. 102	9-13-94 11 a.m. 101.8	9-13-94 6 p.m. 101.5	9-13-94 6 p.m. 100	9-14-94 8 a.m. 101.5	9-14-94 No marked swelling.	No symptoms; was released.
			9-12-94 2:10 a.m. 99.5	9-12-94 5:10 a.m. 101	9-13-94 9 a.m. 102	9-13-94 11:15 a.m. 101.5	9-13-94 6:15 p.m. 100	9-13-94 6:15 p.m. 100	9-14-94 8 a.m. 101.5	9-14-94 2x2 inches; 4 p.m. disappeared 100	No symptoms; was released.
			9-12-94 2 p.m. 101	9-12-94 5 p.m. 98	9-13-94 9 a.m. 101	9-13-94 11:16 a.m. 100.5	9-13-94 6:16 p.m. 100	9-13-94 6:16 p.m. 100	9-14-94 8 a.m. 99	9-14-94 2x2 inches; 4 p.m. disappeared 100	No symptoms; was released.
			9-12-94 2 p.m. 101	9-12-94 5 p.m. 101	9-13-94 9 a.m. 101	9-13-94 11:20 a.m. 99.5	9-13-94 6:30 p.m. 100	9-13-94 6:30 p.m. 100	9-14-94 8 a.m. 100	9-14-94 Small; dis- appeared.	No symptoms; was released.
			9-12-94 2:35 p.m. 101	9-12-94 5:35 p.m. 101	9-13-94 9 a.m. 101.5	9-13-94 11:26 a.m. 101.5	9-13-94 6:26 a.m. 100	9-13-94 6:25 p.m. 100	9-14-94 8 a.m. 102	9-14-94 No swelling	No symptoms; was released.
			9-12-94 2:36 p.m. 100	9-12-94 5:36 p.m. 100	9-13-94 9 a.m. 101.5	9-13-94 11:27 a.m. 101.5	9-13-94 6:27 p.m. 100	9-13-94 6:27 p.m. 100	9-14-94 8:10 a.m. 100.5	9-14-94 1 1/2 x 2 in.; disappeared	No symptoms; was released.
			9-12-94 2:38 p.m. 100.5	9-12-94 5:38 p.m. 100.5	9-13-94 9 a.m. 100	9-13-94 11:30 a.m. 100	9-13-94 6:36 p.m. 100	9-13-94 6:36 p.m. 104	9-14-94 8:15 a.m. 108	9-14-94 2x1 inches.	No symptoms; isolated.
			9-12-94 2:40 p.m. 101	9-12-94 5:40 p.m. 101	9-13-94 9 a.m. 101.5	9-13-94 11:32 a.m. 101.5	9-13-94 6:30 p.m. 102	9-13-94 6:30 p.m. 102	9-14-94 8:17 a.m. 101	9-14-94 2x2 inches; 4:17 p.m. disappeared 99.5	No symptoms; was released.
			9-12-94 2:42 p.m. 102	9-12-94 5:42 p.m. 100	9-13-94 9 a.m. 101	9-13-94 11:34 a.m. 101.8	9-13-94 6:32 p.m. 102	9-13-94 6:32 p.m. 102	9-14-94 8:19 a.m. 101.5	9-14-94 No swelling	No symptoms; was released.
			9-12-94 2:44 p.m. 101	9-12-94 5:44 p.m. 101	9-13-94 9 a.m. 100	9-13-94 11:36 a.m. 101.8	9-13-94 6:34 p.m. 102.5	9-13-94 6:34 p.m. 102.5	9-14-94 8:20 a.m. 100	9-14-94 3x2 inches; 4:26 p.m. disappeared 101	No symptoms; was released.

COUNTY.	LOCALITY.	Outbreaks.		Temperatures Before Injection.			Temperatures After Injection.				Size and Character of Swelling.	OTHER SYMPTOMS.
		Number.	Date.	No. of Cases.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.		
Chippewa.....	Granite Falls twp (Continued.)	1	9-94	15	9-12-94 2-46 p.m. 104	9-12-94 5-46 p.m. 102	9-13-94 11:38 a.m. 101	9-13-94 6-36 p.m. 102.5	9-14-94 8:22 p.m. 101	9-14-94 4:22 p.m. 102	9-14-94 3x2 inches; 4:22 p.m. disappeared	No symptoms; was released.
					9-12-94 9-12-94 2-48 a.m. 102	9-12-94 5-48 p.m. 101.5	9-13-94 11:40 a.m. 101.5	9-13-94 6:38 p.m. 102	9-14-94 8:24 a.m. 101.5	9-14-94 4:54 p.m. 100	9-14-94 Small; dis- 4:54 p.m. appeared.	No. symptoms; was released.
					4-21-93 4 p.m. 103	.....	4-22-93 7 a.m. 103 1/4	4-22-93 5 p.m. 105 1/2	4-22-93 10 p.m. 104	4-23-93 5 p.m. 102 1/2	4-23-93 Size of dim- 5 p.m. ner plate.	Farcy buds and legs swollen; killed.
					4-21-93 4 p.m. 102 1/2	.....	4-22-93 7 a.m. 101 1/4	4-22-93 5 p.m. 104 3/4	4-22-93 10 p.m. 104 1/2	4-23-93 11 a.m. 103	4-23-93 Swelling.	Ulcers on membrane and dis- charge from nostrils; killed.
Cottonwood.....	Windom (V)	1	4-21-93	6	4-21-93 4 p.m. 102 1/2	.....	4-22-93 7 a.m. 103	4-22-93 2 p.m. 104 1/4	4-23-93 1 a.m. 103	4-23-93 5 p.m. 102 1/4	4-23-93 Size of dim- 5 p.m. ner plate.	Farcy buds and legs swollen; killed.
					4-21-93 5 p.m. 102	.....	4-22-93 8 a.m. 102	4-22-93 2 p.m. 103	4-23-93 9 p.m. 104 1/2	4-23-93 10 a.m. 103 1/2	4-23-93 Swelling.	Farcy buds and legs swollen; killed.
					4-21-93 5 p.m. 101 1/4	.....	4-22-93 8 a.m. 101	4-22-93 2 p.m. 102	4-23-93 9 p.m. 104 1/2	4-23-93 10 a.m. 104 1/2	4-23-93 Swelling.	Good condition; after injection had chill and would not eat; was killed.
					4-21-93 5 p.m. 101 1/4	.....	4-22-93 8 a.m. 101 1/4	4-22-93 2 p.m. 101	4-23-93 9 p.m. 102	4-23-93 10 a.m. 101 1/2	4-23-93 No swelling.	Seemed to stand test; released.
Cottonwood.....	Windom twp.....	1	2-5-94	2	2-5-94 11 a.m. 100.2	2-5-94 6 p.m. 100.2	2-6-94 10:45 a.m. 100.2	2-6-94 4:45 p.m. 100.6	2-6-94 7 p.m. 101.4	2-6-94 10 p.m. 101.4	2-7-94 Swelling, 1 p.m. disappeared 10:8 rapidly.	Discharge from nostrils and glands enlarged; condition good; released.
					2-5-94 6 p.m. 100.8	.....	2-6-94 10:45 a.m. 100	2-6-94 4:45 p.m. 100.6	2-6-94 7 p.m. 100.6	2-6-94 10 p.m. 101.2	2-7-94 Swelling, 1 p.m. disappeared 100.8 rapidly.	Appeared healthy; released.

Douglas.....	Lund twp.....	1	5-12-94	2	5-12-94	7 a.m. 100%	5-12-94 12 m. 100%	5-12-94 12 m. 103%	2-5-94 10 p.m. 103½	5-12-94 1 a.m. 102	9-26-93 9:30p.m. 103	9-25-93 9:30p.m. 103.2	9-25-93 9:30p.m. 103.2	9-26-93 9:30a.m. 103	Discharge from nostrils; glands swollen, and animal very stiff; was killed.		Supposed sound; will test again.
			9-14-93		9-14-93	9-14-93 6:30a.m. 100.3	9-14-93 12:30p.m. 100.3	9-14-93 9:21-93 5 p.m. 100.1	9-14-93 9:21-93 5 p.m. 100.3	9-14-93 9:21-93 5 p.m. 100.3	9-25-93 9:25-93 10 p.m. 100.3	9-24-93 10 p.m. 100.3	9-25-93 9:30a.m. 101.3	9-25-93 9:30p.m. 103.1	Supposed healthy but had a cold; was released.		
															Healthy; good condition; released.		
Freeborn	Moscow twp.....	3	1-8-94	4	1-8-94	1-8-94 12:30p.m. 102	1-8-94 6:30p.m. 101.6	1-8-94 7:30a.m. 100.8	1-8-94 11 a.m. 101.5	1-8-94 11 a.m. 101.4	1-5-94 9 a.m. 101.1	1-5-94 9 p.m. 101.2	1-5-94 10 p.m. 101.6	1-5-94 10 p.m. 101.4	Discharge from nostrils; hair rough; very stiff; rigor after injection; was killed.		
															Stiffness after injection; showed no symptoms of glanders; was killed.		
															Legs swollen and farcy buds; stiffness; was killed.		
			7-12-94	1	7-12-94	7-10-94 4 p.m. 102	7-10-94 8 p.m. 102.1	7-11-94 6 a.m. 101.2	7-11-94 8 a.m. 101	7-11-94 12 m. 102.2	7-11-94 5 p.m. 105	7-11-94 9 p.m. 104.8	7-12-94 9 a.m. 103.2	7-12-94 9 a.m. 103.2	Fair condition; discharge from nostrils; was killed.		
															Poor condition; glands enlarged; killed; autopsy confirmed diagnosis.		
Grant.....	Lein twp.....	1	1-2-94	7	1-2-94	2-26-94 3 p.m. 100	2-26-94 3 p.m. 100	2-26-94 100 1-5	2-26-94 3 p.m. 100	2-26-94 3 p.m. 100	2-26-94 3 p.m. 100	2-26-94 3 p.m. 100	2-26-94 3 p.m. 100	2-26-94 3 p.m. 100	Unthrifty; glands enlarged; killed; autopsy confirmed diagnosis.		
															Unthrifty; glands enlarged; killed; autopsy confirmed diagnosis.		

COUNTY.	LOCALITY.	Outbreaks.		Temperatures Before Injection.			Temperatures After Injection.				Size and Character of Swelling.	OTHER SYMPTOMS.
		Number.	Date.	Date, Time and Temp.	Date, Time and Temp.	Date of Infection, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.		
Grant. (Continued.)	Lein twp. (Continued.)	1	3-2-94	.....	.....	2-26-94 3:50 p.m. 100	.....	.....	.....	2-28-94 8:15 p.m. 103	.....	Unthrifty; glands enlarged; discharge from nostrils; killed; autopsy confirmed diagnosis.
				.....	.....	2-26-94 3 p.m. 101½	.....	.....	.....	2-28-94 10:30 p.m. 104½	.....	Emaciated; discharge from nostrils; hard breathing; enlarged glands killed; autopsy confirmed diagnosis.
				.....	.....	2-28-94 11:30 a.m. 100	.....	.....	.....	3-1-94 9:10 p.m. 103½	.....	Starring coat; enlarged glands; killed; autopsy confirmed diagnosis.
				.....	.....	2-26-94 2:58 p.m. 100½	.....	.....	.....	2-28-94 10 p.m. 103½	.....	Emaciated; discharge from nostrils; ulcers; glands enlarged; killed; autopsy confirmed diagnosis.
				8-23-93 102	.....	8-23-93 102 2-5	8-24-93 10:30 a.m. 104 1-5	8-24-93 4:40 p.m. 103	8-25-93 9 a.m. 103 4-5	8-26-93 10 a.m. 101 1-5	.....	Was released.
Hennepin.	Minneapolis (C) ..	17	.....	8-23-93 101 3-5	.....	8-23-93 7 p.m. 101 2-5	8-24-93 10:30 a.m. 103	8-24-93 5 p.m. 103 4-5	8-25-93 9:45 a.m. 101 2-5	.....	.....	Was killed.
				.....	.....	4-8-93 5:40 p.m. 101½	.....	.....	.....	4-9-93 8:40 a.m. 105	.....	Ulcers on schneiderian membrane; was killed.
				2 p.m. 101 2-5	.....	5:50 p.m. 102 2-5	.....	.....	.....	.....	.....	Was killed.
				.....	.....	3-24-94 10 a.m. 102	.....	.....	.....	3-29-94 10 a.m. 103	.....	Clear case; killed.
				3-28-94 4 p.m. 100½	.....	3-28-94 4 p.m. 100½	.....	.....	.....	3-29-94 9:30 a.m. 101 1-5	No swelling	Legs swollen; discharge from nostrils; was released.

COUNTY.	LOCALITY.	Outbreaks.		Temperatures Before Injection.			Date of Injection and Temperature.	Temperatures After Injection.			Size and Character of Swelling.	OTHER SYMPTOMS.
		Number.	Date.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.		Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.		
Hennepin..... (Continued.)	Minneapolis (C)... (Continued.)	1	12-83	11-8-94..... 1:30 pm 100 1-5	11-8-94..... 3 pm 101 1-5	11-10-94..... 101 1-5	11-10-94..... 101 1-5	11-10-94..... 100 1-5	11-10-94..... 100 1-5	11-10-94..... 100 1-5	No swelling.	Legs swollen; was released.
				12-6-93..... 12:20 pm 101	12-6-93..... 4:15 pm 100 3-5	12-7-93..... 11:15 am 100 3-5	12-7-93..... 4:25 pm 101	12-7-93..... 12-4-93..... 10:10 pm 103	12-8-93..... 2:0 am 103	12-8-93..... 6:30 am 103	Swollen and sore.	Enlarged glands; membrane off color; was killed.
				12-6-93..... 12:20 pm 100	12-6-93..... 4:15 pm 100	12-7-93..... 8:30 am 99 3-5	12-7-93..... 11:15 am 100	12-7-93..... 12-7-93..... 10 p.m. 100	12-8-93..... 12:20 am 100	12-8-93..... 2:20 pm 100	No swelling	Was killed d.
				12-6-93..... 12:30 pm 99 2-5	12-6-93..... 4:15 pm 99 2-5	12-7-93..... 8:30 am 99 3-5	12-7-93..... 11:15 am 100	12-7-93..... 12-7-93..... 4:30 pm 100 3-5	12-8-93..... 12:20 am 101	12-8-93..... 2:20 pm 100	No swelling	Was released.
Hubbard	Straight Riv'r twp 1	1	8-94	8-16-94..... 9 a.m. 100.8	8-16-94..... 2 p.m. 100.5	8-17-94..... 8:30 am 100.8	8-17-94..... 8:30 am 101	8-17-94..... 1 p.m. 103.4	8-17-94..... 9 p.m. 104.6	8-17-94..... 11 p.m. 104.6	Swelling 4 7/8 x 6.	Discharge from nostrils; was killed.
				9-2-94..... 6:30 pm 101	9-2-94..... 8:30 pm 101	9-3-94..... 5:30 pm 101	9-3-94..... 10:30 pm 101	9-4-94..... 2:30 am 101	9-4-94..... 9 a.m. 100	9-4-94..... 6:30 am 100 3-5	Swelling 5 x 4.	Slight discharge from nostrils and glands slightly swollen; was released
Jackson.....	Petersburg twp....1	1	10-93	10-21-93..... Eve. 99 9/4	10-22-93..... Morn. 99 3/4	10-22-93..... 9 a.m. 99 9/4	10-22-93..... 9 a.m. 100	10-22-93..... 1 p.m. 100	10-22-93..... 5 p.m. 100	10-23-93..... 9:30 am 100	No swelling.	Was released.
				10-19-93..... Morn. 100	10-19-93..... Eve. 100	10-20-93..... 9 a.m. 100	10-20-93..... 9 a.m. 100	10-20-93..... 3 p.m. 103	10-20-93..... 7 p.m. 105	10-21-93..... 3 a.m. 104 3/4	Swelling 5 x 7 inches.	Was killed.
Jackson.....	Petersburg twp....1	1	10-93	10-19-93..... Morn. 100 1/2	10-19-93..... Eve. 101 1/2	10-20-93..... 9 a.m. 100	10-20-93..... 9 a.m. 100	10-20-93..... 3 p.m. 104 1/4	10-20-93..... 9 p.m. 105 3/4	10-21-93..... 5 a.m. 103 1/2	5 x 8 inches.	Was killed.
				10-19-93..... Morn. 101	10-19-93..... Eve. 101 1/4	10-20-93..... 9 a.m. 100 3/4	10-20-93..... 9 a.m. 100 3/4	10-20-93..... 1 p.m. 104 3/4	10-20-93..... 5 p.m. 106	10-21-93..... 5 a.m. 104	6 x 9 inches; painful.	Discharge from nostrils; was killed.

Jackson.....	1	11-93	11-20-93 9:30 am 98	.....	11-21-93 9:30 a.m. 98	11-21-93 8:30 pm 101 1/4	11-21-93 9:30 pm 103 1/2	11-21-93 11:30 pm 104	11-22-93 8:30 am 105 1/2	Size of plate; from nostrils after injection; was killed.
.....			11-10-93 4 p.m. 100	11-12-93 10 p.m. 99 2-5	11-13-93 7 a.m. 100	11-15-93 8 a.m. 100	11-15-93 10 p.m. 101	11-16-93 8 a.m. 98 1/2	11-17-93 10 a.m. ing; disap- peared.	Was released.
Kittson.....	1	11-93	1-8-94 2 p.m. 99 3-5	1-8-94 5 p.m. 99	8 p.m. 99 3-5	1-8-94 8 p.m. 99 3-5	1-8-94 12 m. 100 3-5	1-9-93 10 a.m. 104 2-5	1-10-93 9 p.m. 103	Glands hardened; discharge from nostrils; was killed.
.....			11-2-93 5 p.m. 100.8	.....	.....	11-2-93 5:15 p.m. 100.5	.....	.....	11-3-94 8 a.m. 99.2	No symptoms except oedema of legs; was released.
Le Sueur.....	1	11-2-93	9-28-94 11:40 am 98.8	10 11-94 10:45 am 99	11-5-94 4:25 pm 101	11-5-94 4:40 pm 101	11-6-94 3:30 pm 102.7	.....	.....	No symptoms; quarantined for 18 days; released.
Lincoln	1	9-94	9-28-94 10:40 am 101	10-11-94 10:40 am 101	11-5-94 4:30 pm 101	11-5-94 4:30 pm 101	11-6-94 3:20 pm 104.1	.....	.....	Discharge from nostrils; large swelling glands on left side; was killed.
.....			5-9-94 10:30 am 99 3-10	.....	.....	5-24-94 11:15 am 101.2	5-25-94 11:45 am 104.1	.....	.....	Glands swollen; discharge from nostrils; was killed.
Lyons.....	1	5-94	5-9-94 10:45 am 101	.....	.....	5-24-94 11 a.m. 101.7	5-25-94 10 a.m. 105	.....	.....	Glands swollen; discharge from nostrils; stiff in legs after injection; was killed.
.....			5-30-94 3 p.m. 102 1/2	5-30-94 8 p.m. 103 1/2	.....	5-31-94 5 a.m. 102	5-31-94 4 p.m. 104 1/2	5-31-94 8 p.m. 104 1/2	6-1-94 6 a.m. 101 4-5	Enlarged gland; cough; discharge from nostrils; was killed.
Marshall.....	1	5-94	.....	.....	.....	6-9-94 8 a.m. 100 2-5	6-9-94 2 p.m. 100 2-5	6-10-94 8:45 am 103	6-10-94 7 p.m. 102 3-5	Enlarged glands; cough; discharge from nostrils; ulcers; was killed.
.....			.....	.....	.....	6-9-94 8 a.m. 101	6-8-94 2 p.m. 101.4	6-10-94 8:35 am 103.4	6-10-94 12x8 inches 103.6	Discharge from nostrils; ulcers; glands enlarged and adhering to max. bone; was killed.

COUNTY.	LOCALITY.	Outbreaks.		Temperatures Before Injection.			Temperatures After Injection.			Size and Character of Swelling.	OTHER SYMPTOMS.
		Number.	Date.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.		
Marshall.....	Augsberg twp.....	1	11 83	11-28-93 10 a.m. 102	11-28-93 7 p.m. 101	11-28-93 11 p.m. 103	11-28-93 11 p.m. 104	11-29-93 3 a.m. 104	11-29-93 7 a.m. 103 2-5	8 inches in diameter; was killed.	Glands enlarged and adhering to bone; discharge from nostrils; was killed.
				11-28-93 10 a.m. 103 2-5	11-28-93 9 p.m. 104 2-5	11-28-93 3 a.m. 105	11-28-93 3 a.m. 104 1-5	11-29-93 7 a.m. 104 1-5	11-29-93 11:30 a.m. 103 2-5	9 3-5 inches in diameter; was killed.	Glands enlarged and adhering; discharge from nostrils; ulcers; was killed.
				11-28-93 10 a.m. 101 2-5	11-28-93 9 p.m. 103	11-29-93 1 a.m. 104 2-5	11-29-93 3 a.m. 105	11-29-93 7 a.m. 104	11-29-93 7 a.m. 104	6 inches in diameter; painful.	Thin; glands hardened and adhering; discharge from nostrils; was killed.
				11-28-93 10 a.m. 102 2-5	11-28-93 9 p.m. 105	11-28-93 1 a.m. 105 3-5	11-28-93 1 a.m. 105 3-5	11-29-93 7 a.m. 105	11-29-93 11:30 a.m. 103 4-5	Painful	Poor; glands enlarged; was killed. (A reinjection.)
				1-3-94 1 p.m. 101 2-5	1-4-94 9 a.m. 101 3-5	1-4-94 3 p.m. 103 2-5	1-4-94 1 p.m. 106	1-5-94 3 a.m. 105	1-5-94 3 p.m. 104	Painful swelling.	Ulcers; discharging from nostrils; was killed.
				1-3-94 1 p.m. 101	1-3-94 8 p.m. 100 2-5	1-4-94 9 a.m. 101	1-4-94 3 p.m. 103 2-5	1-4-94 7 p.m. 105	1-5-94 1 p.m. 103 1-5	6 inches in diameter; painful.	Discharge at nose; poor condition; was killed.
				1-3-94 1 p.m. 101 3-5	1-3-94 4 p.m. 101	1-4-94 9 a.m. 101 2-5	1-4-94 3 p.m. 104 3-5	1-4-94 7 p.m. 106 1-5	1-5-94 11 p.m. 103 1-5	10 inches in diameter; painful.	Feeds and looks well, etc.; was killed.
				1-3-94 1 p.m. 101	1-3-94 8 p.m. 100	1-4-94 9 a.m. 101 1-5	1-4-94 3 p.m. 104 2-5	1-4-94 11 p.m. 105 2-5	1-5-94 3 a.m. 104 3-5	9 3-5 inches in diameter; painful.	Poor condition.
				11-29-93 1 a.m. 103	11-29-93 3 a.m. 102 3-5	11-29-93 7 a.m. 103	11-29-93 11:30 a.m. 104 3-5	11-29-93 2 p.m. 105	12-3-93 5 p.m. 101 2-5		
				1-3-93 1 p.m. 101 1-5	1-3-94 8 p.m. 101	1-4-94 9 a.m. 101 1-5	1-4-94 3 p.m. 106	1-4-94 9 p.m. 105 3-5	1-5-94 3 a.m. 105 3-5	8 inches in diameter; was killed. (A reinjection.)	

Martin.....	Cedar Mills twp... 1	5-94 4	.....	.....	5-19-94 6 p.m. 100%	5-19-94 10:30 pm 101	5-30-94 5:30 am 100%	5-20-94 7 a.m. 100	5-20-94 10 a.m. 100	Small.	Was released.
			.....	.....	5-19-94 6:30 pm 101½	5-19-94 11:30 pm 101	5-20-94 3:30 am 100½	5-20-94 7 a.m. 100	5-20-94 10 a.m. 100	Small.	Was released.
			.....	.....	5-19-94 6 p.m. 101½	5-19-94 11:30 pm 101½	5-20-94 3:30 am 104½	5-20-94 7 a.m. 105	5-20-94 10 a.m. 105½	5 inches in diameter.	Glands swollen; was killed.
			.....	.....	5-19-94 8 p.m. 101½	5-19-94 11:30 pm 101	5-20-94 3:30 am 108½	5-20-94 7 a.m. 105¾	5-20-94 10 a.m. 104½	6 inches in diameter.	Glands swollen; was killed.
McLeod.....	Round Grovetwp. 1	6-94 1	6-2-92 7 a.m. 100	6-3-94 1 p.m. 100½	6-3-94 5 a.m. 100	6-3-94 11 a.m. 109½	6-3-94 4 p.m. 100¾	6-3-94 6 p.m. 100¾	6-3-94 10 p.m. 101	Small swell. ing.	Discharge from nostrils; bones enlarged; was released.
			.....	.....	10-24-94 8 a.m. 100	10-24-94 12 m. 100¾	10-24-94 4:30 pm 102½	10-24-94 6 p.m. 103¾	10-24-94 9:15 pm 105¼	5 inches in diameter.	Discharge from ulcerated nostrils; sub max. glands swollen; was killed.
Meeker.....	Collinwood twp... 1	12-93	12-4-93 9 p.m. 100½	.....	12-4-93 9:30 pm 100¾	12-5-93 8 a.m. 102 5	12-5-93 7:30 am 105 2-5	12-5-93 9 a.m. 105 2-5	12-5-94 11 a.m. 105	Large and painful.	Abscess, abscess discharging; sub. max. glands ulcerated; was killed.
			12-4-93 9 p.m. 102½	.....	12-4-93 9:20 pm 102½	12-5-94 5:30 am 104	12-5-94 7:30 am 104 4-5	12-5-94 9 a.m. 104 4-5	12-5-94 11 a.m. 105	Large.	Discharge from nostrils; ulcers; glands hard; was killed.
			12-4-93 9:30 pm 100½	.....	12-4-93 9:20 pm 100¾	12-4-93 2:50 am 101½	12-4-93 5:30 am 104½	12-4-93 9 a.m. 105¾	12-4-93 11 a.m. 105 2-5	Large.	Discharge from nostrils; grapey glands; was killed.
			12-4-93 10 p.m. 101½	.....	12-4-93 10:30 pm 101¾	1-5-93 3 a.m. 101¾	1-5-93 8 a.m. 101 3-5	12-5-93 9:30 am 102 2-5	12-5-93 11:15 am 100	3 inches in diameter.	Was released.
Meeker.....	Collinwood twp... 1	12-93	12-4-93 10 p.m. 101½	.....	12-4-93 10:30 pm 101¾	12-5-93 3 a.m. 101¾	12-5-93 7:40 am 101 2-5	12-5-93 9:30 am 101 2-5	12-5-93 11:15 am 99	Small swell. ing.	Was released.
			12-10-93 5 p.m. 100 2-5	.....	12-10-93 5 p.m. 100 2-5	12-10-93 10:30 pm 101	12-11-93 5:30 am 101½	12-11-93 8 a.m. 101½	12-11-93 9:30 am 99 4-5	Swelling.	Was released.

COUNTY.	LOCALITY.	Outbreaks.		Temperatures Before Injection.			Temperatures After Injection.			Size and Character of Swelling.	OTHER SYMPTOMS.
		Number.	Date.	Date, Time and Temp.	Date, Time and Temp.	Date of Infection, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.		
Meeker..... (Continued.)	Collinwood twp... (Continued.)	1	12-96	12-10-93 12 m. 101½	12-13-93 11 a.m. 99	12-10-93 7:30 a.m. 105	12-10-93 11:30 a.m. 102½	12-14-93 6 a.m. 101	No marked swelling.	Discharge from nostrils; was released.
				1-23-94 8:30 a.m. 98	1-23-94 6:30 p.m. 101	1-24-94 9 a.m. 101	1-24-94 1:24-94 4:45 p.m. 103	1-25-94 11:45 p.m. 101.2	8-25-94 8:30 a.m. 101.3		
				1-23-94 8 a.m. 100	1-23-94 1 p.m. 98	1-24-94 10:45 a.m. 101.2	1-24-94 1:24-94 4:45 p.m. 104.2	1-25-94 12 m. 103.1	1-26-94 2 p.m. 102		
				1-23-94 8 a.m. 100	1-23-94 1 p.m. 101.2	1-24-94 6 p.m. 102	1-24-94 7 p.m. 106	1-25-94 12 m. 102.5	1-26-94 2 p.m. 102.8		
Mower.....	Austin (C).....	1	1-94	1-25-94 9 a.m. 100.5	1-25-94 12 m. 100.5	1-26-94 8:30 a.m. 100	1-26-94 3 p.m. 101.4	1-27-94 9 a.m. 103.6	1-27-94 7 p.m. 103.8	Large and painful.	Ulcers; fair condition; stiffness; was killed.
				1-23-94 9 a.m. 100.5	1-23-94 12 m. 101.8	1-24-94 9 p.m. 100	1-24-94 2 p.m. 102.4	1-25-94 8 a.m. 104.4	1-25-94 8 p.m. 104.6		
				10-31-94 5 p.m. 101½	.....	11-1-94 7:30 a.m. 100	11-1-94 11:30 a.m. 106	11-1-94 3:30 p.m. 102	11-1-94 9:30 p.m. 101	
				.....	.....	10-8-93 9 a.m. 99	10-8-94 3 p.m. 101 2-5	10-9-94 5 p.m. 98 3-5	10-9-94 9:30 p.m. 101 4-5
Murray.....	Avoca (V).....	1	10-94	No marked swelling.	Discharge from nostrils; glands swollen; membrane ulcerated; no discharge since injection; killed.
					
Nobles.....	Bigelow twp.....	1	10-93	No marked swelling.	Discharge from nostrils; glands swollen; was released.
					
Nobles.....	Worthington (V).....	1	9-93	9-15-93 4:50 p.m. 100 3-5	9-16-93 12:20 p.m. 100	9-17-93 3 p.m. 101 3-5	9-17-93 9 p.m. 101 3-5	9-18-93 8 a.m. 100 1-5	9-18-93 5 p.m. 100 3-5	Small.	Healthy; was released.
					

Nobles		Worthington (V.) ..		Reinfection.		Reinfection.		Reinfection.		Reinfection.	
(Continued.)		(Continued.)		6-9-93		6-9-93		6-9-93		6-9-93	
9-15-93 2:45 pm	9-16-93 5 p.m.	9-16-93 12:45 pm	9-17-93 7 a.m.	9-17-93 1 p.m.	9-17-93 7 p.m.	9-17-93 11 p.m.	9-17-93 11 p.m.	9-17-93 11 p.m.	9-17-93 11 p.m.	9-17-93 11 p.m.	9-17-93 11 p.m.
100 2-5	99 3-5	100 1-5	100 2-5	102 1-5	102 1-5	105 2-5	105 2-5	105 2-5	105 2-5	105 2-5	105 2-5
9-29-93 8:30 am	8-29-93 1 p.m.	8-29-93 5:30 pm	9-30-93 6 a.m.	9-30-93 2 p.m.	9-30-93 8 p.m.	9-30-93 10:1-93	9-30-93 8 a.m.	9-30-93 10:1-93	9-30-93 8 a.m.	9-30-93 10:1-93	9-30-93 8 a.m.
100 1-5	99 3-5	100	99 1-5	104	105 1-5	104	105 1-5	104	105 1-5	104	105 1-5
1-12-94 3 p.m.	.....	.....	1 13 94	1-13 94	1 13 94	1 13 94	1 13 94	1 13 94	1 13 94	1 13 94	1 13 94
100	.....	.....	1 p.m.	7 p.m.	10 p.m.	10 p.m.	10 p.m.	10 p.m.	10 p.m.	10 p.m.	10 p.m.
.....	.....	.....	98 3-5	102 2-5	104 2-5	104 2-5	104 2-5	104 2-5	104 2-5	104 2-5	104 2-5
9-15-93 2:45 pm	9-14-93 5 p.m.	9-15-93 12:45 pm	9-16-93 7 a.m.	9-17-93 3 p.m.	9-17-93 11 p.m.	9-17-93 11 p.m.	9-17-93 11 p.m.	9-17-93 11 p.m.	9-17-93 11 p.m.	9-17-93 11 p.m.	9-17-93 11 p.m.
100 2-5	101	101 1-5	101 1-5	103 4-5	103 1-5	103 1-5	103 1-5	103 1-5	103 1-5	103 1-5	103 1-5
9-29-93 8:30 am	9-29-93 1 p.m.	9-29-93 100 2-5	9-30-93 6 a.m.	9-30-93 2 p.m.	9-30-93 8 p.m.	9-30-93 10:1-93	9-30-93 8 a.m.	9-30-93 10:1-93	9-30-93 8 a.m.	9-30-93 10:1-93	9-30-93 8 a.m.
99	100 2-5	100 4-5	100 1-5	103 3-5	105 3-5	105 3-5	105 3-5	105 3-5	105 3-5	105 3-5	105 3-5
1-12-94 3 p.m.	.....	.....	1-10-94	1-13 94	1-13 94	1-13 94	1-13 94	1-13 94	1-13 94	1-13 94	1-13 94
99 4-5	.....	.....	1 p.m.	7 p.m.	11 p.m.	11 p.m.	11 p.m.	11 p.m.	11 p.m.	11 p.m.	11 p.m.
.....	.....	.....	100	102 1-5	105	104 8-5	104 8-5	104 8-5	104 8-5	104 8-5	104 8-5
3-6-94 9 a.m.	3-6-94 3 p.m.	3-6-94 100 1-5	3-7-94	3-7-94	3-7-94	3-7-94	3-7-94	3-7-94	3-7-94	3-7-94	3-7-94
100	100 1-5	100 1-5	6:30 a.m.	1:30 p.m.	3:30 p.m.	7:30 p.m.	7:30 p.m.	7:30 p.m.	7:30 p.m.	7:30 p.m.	7:30 p.m.
.....	.....	.....	100 2-5	100 1-5	101 4-5	101 4-5	101 4-5	101 4-5	101 4-5	101 4-5	101 4-5
9-29-93 8:30 am	9-29-93 1 p.m.	9-29-93 101 1-5	9-30-93 6 a.m.	9-30-93 2 p.m.	9-30-93 8 p.m.	9-30-93 10:1-93	9-30-93 8 a.m.	9-30-93 10:1-93	9-30-93 8 a.m.	9-30-93 10:1-93	9-30-93 8 a.m.
101 1-5	101	101 2-5	101 2-5	101 1-5	103 3-5	103 3-5	103 3-5	103 3-5	103 3-5	103 3-5	103 3-5
1-12-94 3 p.m.	.....	.....	1-13-94	1-13 94	1-13 94	1-13 94	1-13 94	1-13 94	1-13 94	1-13 94	1-13 94
100 3-5	.....	.....	1 p.m.	7 p.m.	11 p.m.	11 p.m.	11 p.m.	11 p.m.	11 p.m.	11 p.m.	11 p.m.
.....	.....	.....	100	103 1-5	104 2-5	104 2-5	104 2-5	104 2-5	104 2-5	104 2-5	104 2-5
3-6-94 9 a.m.	3-6-94 3 p.m.	3-6-94 101	3-4-94	3-7-94	3-7-94	3-7-94	3-7-94	3-7-94	3-7-94	3-7-94	3-7-94
101	100 7-5	100 5	6:30 a.m.	1 p.m.	8:30 p.m.	7:30 p.m.	7:30 p.m.	7:30 p.m.	7:30 p.m.	7:30 p.m.	7:30 p.m.
.....	.....	.....	100 5	101 4	103 4	105 1	105 1	103	103	103	103
9-28-93 8:30 am	9-29-93 1 p.m.	9-29-93 99 3-5	9-30-93 6 a.m.	9-30-93 2 p.m.	9-30-93 8 p.m.	9-30-93 10:1-93	9-30-93 8 a.m.	9-30-93 10:1-93	9-30-93 8 a.m.	9-30-93 10:1-93	9-30-93 8 a.m.
99 3-5	99 3-5	99 3-5	99 2-5	99 3-5	100 4-5	102	99	99	101-93	101-93	101-93
9-29-93 8:30 am	9-29-93 1 p.m.	9-29-93 100 3-5	9-30-93 6 a.m.	9-30-93 12 m.	9-30-93 4 p.m.	9-30-93 100 2-5	9-30-93 100 3-6	9-30-93 100 3-6	9-30-93 100 3-6	9-30-93 100 3-6	9-30-93 100 3-6
100 3-5	100	100	100 1-5	99 4-5	100 2-5	100 2-5	100 2-5	100 2-5	100 2-5	100 2-5	100 2-5
9-29-93 8:30 am	9-29-93 1 p.m.	9-29-93 101 1-5	9-30-93 6 a.m.	9-30-93 2 p.m.	9-30-93 8 p.m.	9-30-93 10:1-93	9-30-93 8 a.m.	9-30-93 10:1-93	9-30-93 8 a.m.	9-30-93 10:1-93	9-30-93 8 a.m.
99 2-5	100	101 1-5	101 1-5	101 2-5	103 1-5	103 1-5	103 1-5	103 1-5	103 1-5	103 1-5	103 1-5
1-12-94 3 p.m.	.....	.....	1-13-94	1-13 94	1-13 94	1-13 94	1-13 94	1-13 94	1-13 94	1-13 94	1-13 94
100	.....	.....	1 p.m.	7 p.m.	11 p.m.	11 p.m.	11 p.m.	11 p.m.	11 p.m.	11 p.m.	11 p.m.
.....	99 3-5	100	101 1-5	101 1-5	101 1-5	101 1-5	101 1-5	101 1-5	101 1-5
.....	100	100 7-5	100	100 7-5	100	100 7-5	100	100 7-5	100
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COUNTY.	LOCALITY.	Outbreaks.		Temperatures Before Injection.			Date of Injection, Time and Temp.	Temperatures After Injection.			Size and Character of Swelling.	OTHER SYMPTOMS.
		Number.	Date.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.		Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.		
Nobles. (Continued.)	Worthington (V). (Continued.)	1	9-93 16	9-29-93 8:30 am 100	9-29-93 1 p.m. 99 4-5	9-29-93 5:30 pm 101	9-30-93 6 a.m. 100 2-5	9-30-93 2 p.m. 103 1-5	9-30-93 6 p.m. 104 4-5	9-30-93 10 p.m. 105 4-5	10-1-93 4 inches in diameter.	Glands slightly swollen; coughs.
				1-12-94 5 p.m. 99 3-5	.....	.....	1-13-94 1 p.m. 99	1-13-94 7 p.m. 103 1-5	1-13-94 11 p.m. 105 1-5	1-14-94 3 a.m. 105 3-5	6x4 inches.	Discharge from nostrils after injection; glands swollen.
				3-6-94 9 a.m. 100	3-6-94 3 p.m. 100 1	3-6-94 6 p.m. 99	3-7-94 6:30 am 99	3-7-94 1:30 pm 102 2	3-7-94 5:30 pm 105 1	3-7-94 7:30 pm 105 4	6x5 inches; painful.	Discharge from nostrils; was killed.
				9-29-93 8:30 am 101	9-29-93 1 p.m. 100 2-5	9-29-93 5:30 pm 101	9-30-93 6 a.m. 102 4-5	9-30-93 12 m. 101 2-5	9-30-93 6 p.m. 101 1-5	10-1-93 8 a.m. 101 2-5	10-1-93 Slightly welling.	No symptoms of glands; was released.
				9-29-93 8:30 am 100 4-5	9-29-93 1 p.m. 99 3-5	9-29-93 5:30 pm 100 2-5	9-30-93 6 a.m. 99 4-5	9-30-93 2 p.m. 102 4-5	9-30-93 8 p.m. 105	10-1-93 8 a.m. 103	10-1-93 Largely welling.	Cough since injection; no other symptoms.
				1-12-94 3 p.m. 99 2 5	.....	.....	1-13-94 1 p.m. 99 1-5	1-13-94 7 p.m. 101 3-5	1-13-94 11 p.m. 104 4-5	1-14-94 3 a.m. 103 3-5	3x4 inches.	After injection glands became swollen.
				3-6-94 9 a.m. 99 2	3-6-94 3 p.m. 99 4	3-6-94 6 p.m. 99 2	3-7-94 6:30 am 99 1	3-7-94 1:30 pm 101 4	3-7-94 5:30 pm 105 1	3-7-94 10:30 pm 104 2	3-8-94 Hard, painful swelling.	No other symptoms; was killed.
				9-29-93 8:30 am 100	9-29-93 1 p.m. 100	9-29-93 5:30 pm 100	9-30-93 6 a.m. 99 3-5	9-30-93 2 p.m. 101	9-30-93 8 p.m. 102 3-5	10-1-93 8 a.m. 101 3-5	10-1-93 Largely welling.	Coughs; was killed.
				9-24-93 9:30 am 104 1-5	9-24-94 2 p.m. 104 1-5	9-24-93 5:30 pm 104 1-5	9-25-93 6 a.m. 104	9-25-93 2 p.m. 104 4-5	9-25-93 8 p.m. 104 3-5	9-26-93 4:30 pm 103 2-5	No swelling.	No symptoms of glands; sick with pleuro-pneumonia; released as glands suspect.
				9-29-93 8:30 am 101 2-5	9-29-93 1 p.m. 100 3-5	9-29-93 5:30 pm 99 1-5	9-30-93 6 a.m. 101	9-30-93 2 p.m. 100	9-30-93 8 p.m. 101 1-5	10-1-93 8 a.m. 100 2-5	10-1-93 Slightly welling.	No symptoms of glands; was released.

[illegible]

COUNTY.	LOCALITY.	Outbreaks.		Temperatures Before Injection.			Temperatures After Injection.				Size and Character of Swelling.	OTHER SYMPTOMS.
		Number.	Date.	Date, Time and Temp.	Date, Time and Temp.	Date of Injection, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.	Date, Time and Temp.		
Renville <i>(Continued.)</i>	Preston Lake twp. <i>(Continued.)</i>	1	3-94	.....	.....	3-19-94 2:15 p.m. 101	2-19-94 3 p.m. 103½	3-20-94 2 a.m. 103	3-20-94 4:30 a.m. 103	3-20-94 6 a.m. 101½	Small and reducing.	Slight swelling of gland; was released after thirty days.
				.....	.....	3-19-94 1:30 p.m. 102	3-19-94 6 p.m. 105	3-19-94 12 m. 105¾	3-20-94 2 a.m. 105½	3-20-94 4:30 a.m. 105	6 inches in diameter; painful.	Discharge from nostrils; ulcers; animal stiff; glands swollen; was killed.
			
Renville	Boone Lake twp.	1	5-94	.....	.....	5-7-94 6 p.m. 101 3.5	5-27-94 12 m. 102½	5-8-94 3 a.m. 104	5-8-94 6 a.m. 105 2-5	5-8-94 8 a.m. 105½	6 inches in diameter.	Sticky discharge from nostrils; glands hard and adhered; was killed.
			
			
Traverse	Brown's Valley	1	10-93	.....	.....	10-21-93 11 a.m. 99 9-10	10-21-93 6 p.m. 103	10-22-93 8:30 a.m. 102½	10-23-93 6 p.m. 102	10-23-93 8 a.m. 102 2 5	4 inches in diameter; painful.	Discharge from nostrils; glands enlarged; was killed.
			
			
Wadena	Aldrich twp.	1	6-94	.....	.....	6-15-94 7 a.m. 102	6-15-94 8:15 p.m. 104	6-15-94 5:15 p.m. 104½	6-15-94 9:15 p.m. 103½	6-15-94 11:15 p.m. 102 1-5	Large swelling.	Discharge from nostrils; glands swollen; legs swollen; was killed.
			
			
Washington	Cottage Grove twp.	1	10-94	.....	.....	10-18-94 7 a.m. 100.8	10-18-94 1 p.m. 100.9	10-18-94 4 p.m. 102	10-19-94 11 a.m. 101.6	10-19-94 9 p.m. 104.3	Large and painful.	Negative symptoms; was killed.
				.....	.....	10-18-94 7 a.m. 99.4	10-18-94 7 p.m. 100.3	10-19-94 11 a.m. 99.4	10-19-94 5 p.m. 103.1	10-19-94 7 p.m. 102.8	2x3 inches.	Sore on nasal bone; was killed.
				.....	.....	10-18-94 9 p.m. 100.1	10-18-94 4 p.m. 100.3	10-19-94 5 a.m. 100.3	10-19-94 1 p.m. 100.3	10-19-94 7 p.m. 100.2	None.	Spots on left side septum; was released.

Washington (Continued.)	Cottage Grovetwp (Continued.)	10-94	10-17-94 5 p.m. 100	10-17-94 9 p.m. 100.3	10-18-94 7 a.m. 100.8	10-18-94 4 p.m. 101.5	10-18-94 12 p.m. 101	10-19-94 9 a.m. 100	10-19-94 7 p.m. 101.2	Symptoms negative; was released.
			10-17-94 5 p.m. 100.5	10-17-94 9 p.m. 100.7	10-18-94 7 a.m. 100.7	10-18-94 101.2	10-18-94 7 a.m. 101	10-19-94 1 p.m. 100.6	10-19-94 7 p.m. 100.7	Negative symptoms; was released.
			10-17-94 5 p.m. 100.7	10-17-94 9 p.m. 101	10-18-94 7 a.m. 101.2	10-18-94 101	10-18-94 7 a.m. 100.9	10-19-94 11 a.m. 100.3	10-19-94 7 p.m. 100.3	Negative symptoms; was released.
			10-17-94 5 p.m. 100.8	10-17-94 9 p.m. 100.4	10-18-94 7 a.m. 100.6	10-18-94 100.7	10-18-94 7 a.m. 100.5	10-19-94 1 p.m. 100.6	10-19-94 7 p.m. 101	Small induration in left parotid was released.
Wilkin	Brandrup twp.....	1	8-31-94 2 p.m. 102	8-31-94 4:55 p.m. 102	9-1-94 10 a.m. 102	9-1-94 1:30 p.m. 105	9-1-94 9:20 p.m. 105½	9-2-94 1 a.m. 105	9-2-94 9 p.m. 104	Legs swollen; was killed.
Wilkin	Breckenridge twp	1	8-31-94 3:30 p.m. 100½	8-31-94 6:30 p.m. 100½	9-1-94 7 a.m. 100	9-1-94 12 m. 100½	9-1-94 8:30 p.m. 104	9-2-94 4:30 p.m. 105	9-3-94 2 p.m. 103	No symptoms; was killed.
Wilkin		3	8-31-94 5 p.m. 101	8-31-94 6:30 p.m. 101	9-1-94 7 a.m. 100	9-1-94 8:30 p.m. 104½	9-2-94 2 p.m. 104	9-2-94 10 p.m. 104½	9-3-94 2 p.m. 104	Glands enlarged; was killed.
			8-31-94 5 p.m. 101	8-31-94 6:30 p.m. 100½	9-1-94 7 a.m. 100	9-1-94 2:30 p.m. 103¾	9-1-94 8:30 p.m. 105	9-2-94 2 p.m. 104½	9-3-94 2 p.m. 103	Was killed.
Wright	Chatham twp.....	1	2-19-94 9 a.m. 100	2-19-94 6 p.m. 101	2-20-94 8 a.m. 101.1-5	2-20-94 5:30 p.m. 104 1-5	2-20-94 7:30 p.m. 105	2-20-94 11:30 p.m. 103 4-5	2-21-94 12 a.m. 102.5	Glands enlarged and ulcers; was killed.
Wright	Howard Lake (V).	1	6-18-94 4 p.m. 101 3-5	6-18-94 6 p.m. 101	6-19-94 9:40 a.m. 100 3-5	6-19-94 6:10 p.m. 104 3-5	6-19-94 4 p.m. 102	6-20-94 9:30 a.m. 103 2-5	6-20-94 8:30 a.m. 102	Discharging from nostrils; ulcers; glands enlarged; was killed.
		2	6-18-94 6 p.m. 101	6-18-94 6 p.m. 101	6-19-94 8 a.m. 100 3-5	6-19-94 4 p.m. 102	6-19-94 4 p.m. 102	6-20-94 8:30 a.m. 102	6-20-94 8:30 a.m. 102	Ulcers; was released.

APPENDIX NO. IV.

TRACTS RELATING TO PUBLIC HEALTH.

Health Officers and Chairmen will please order by number.

Please reserve for reference. Apply to your local Board of Health or to the Secretary of the State Board at St. Paul, for copies to distribute.

1. LAWS.—Organization and Duties of Boards of Health; Diseases of Animals and Men; Offensive Trades; Water Supply, Vital Statistics.
2. MAY SANITARY INSPECTION.—Why and How to Make It.
3. DOMESTIC HYGIENE.—On the Farm, in the Village and City.
4. THE EARTH CLOSET.—Its Construction, Limitations and Use The advantages of above-ground collection of human excreta, with a simple and inexpensive arrangement for the destruction of same by dry garden mould.
5. HEALTH OF CHILDREN IN SCHOOLS.
6. PLAN FOR THE INSTRUCTION OF TEACHERS IN SANITARY SCIENCE AT UNIVERSITY OF MINNESOTA.
7. THE PERIOD OF INCUBATION OF INFECTIOUS DISEASES OF MEN AND THE DURATION OF THE INFECTION.
8. DEPARTMENT OF PUBLIC HEALTH.—University of Minnesota. Aid to health officers and physicians in diagnosis of infectious diseases.
9. FORM FOR REPORTING INFECTIOUS DISEASES OF MEN TO LOCAL BOARDS OF HEALTH.
10. FORM FOR REPORTING INFECTIOUS DISEASES OF MEN BY THE LOCAL BOARD OF HEALTH TO THE STATE BOARD.
11. MEASLES.—Why Control the Disease?
12. DIPHTHERIA.—A Plain Statement of Its Mortality, and Management.
13. SCARLATINA.—Its Statistics, Prevention and Control.
14. ENTERIC (Typhoid) FEVER.—What is It? How to Escape It and How to Deal With It.
15. SMALLPOX AND VACCINATION.
16. VACCINE AND VACCINATION.—Minnesota Vaccine Station; Its Organization and Rules for Distributing and using Vaccine.
17. RABIES (Hydrophobia) IN MAN AND ANIMALS.—Its Recognition and Management.
18. LEPROSY IN MINNESOTA.—Statistics and History.
19. FORM FOR REPORTING INFECTIOUS DISEASES OF ANIMALS BY THE LOCAL BOARD OF HEALTH TO THE STATE BOARD.
20. TUBERCULOSIS IN DOMESTIC CATTLE and Use of Tuberculin.
21. GLANDERS.—A Fatal Disease of the Horse, Communicable to Man.
22. THE ADVANTAGE AND USE OF MALLEIN for the Diagnosis of Glanders.
23. LUMPY JAW (Actinomycosis) IN CATTLE.
24. PLEURO-PNEUMONIA IN CATTLE.
25. SCAB IN SHEEP.
26. INFECTIOUS DISEASES OF HOGS (Hog Cholera).—Causes and Control.
27. FORMS FOR BILLS OF HEALTH OF ANIMALS Coming Into, Passing Through or Going from Place to Place in the State.

CHAPTER 132, LAWS OF 1883.

AN ACT RELATING TO INFECTIOUS AND EPIDEMIC DISEASES, AND THE PRESERVATION OF THE PUBLIC HEALTH.

(WITH AMENDMENTS TO APRIL 24, 1892.)

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. Whenever any part of this state appears to be threatened with, or is affected by, any epidemic or infectious disease, the State Board of Health may make, and from time to time alter and revoke, regulations for all or any of the following, among other purposes: (1) For the speedy interment of the dead. (2) For house to house visitation. (3) For the provision of medical aid and accommodation for patients, physicians and nurses. (4) For the promotion of cleansing, ventilation and disinfection; and (5) Guarding against the spread of disease by quarantine or exclusion of any infected persons, and may by order declare all or any of the regulations so made to be in force within the whole or any part or parts of the district of any Local Board of Health in this state and to apply to any vessels on any of the waters of this state or to any railway cars or trains or public vehicles of any kind, for the period named in such order, and may by any subsequent order abridge or extend such period.

SEC. 2. All regulations and orders so made by the State Board of Health shall be published in some paper of general circulation published at the capital of the state, and also in some paper published in the county where such disease may exist, and such publication shall be conclusive evidence thereof for all purposes.

SEC. 3. The Local Board of Health of any district or districts within which, or part of which regulations so issued by the State Board of Health are declared to be in force, shall superintend and see to the execution thereof, and shall appoint and pay such medical or other officers or persons, and do and provide all such acts, matters and things as may be necessary for mitigating or preventing the spread of any such disease, or for superintending or aiding in the execution of or executing such regulations as the case may require; said Local Board may also from time to time direct any prosecution or legal proceedings for or in respect of the willful disregard or neglect of any such regulation, or any regulation duly made and established by said Local Board. Said Local Boards shall have power of entry on any premises, vessel or vehicle, for the purpose of executing, or superintending the execution, of any regulations so issued by said State Board of Health or said Local Board.

SEC. 4. The town supervisors of each town together with a physician, to be employed by said supervisors when in their judgment necessary, or when ordered by the State Board of Health, shall constitute a Board of Health, and all villages, boroughs and cities shall have a Board of Health, to be chosen and to consist of the number hereafter provided, anything in the charter of any such village, borough or city to the contrary notwithstanding; such Boards shall, within their respective towns, villages, boroughs and cities, have and exercise all the powers necessary for preservation of the public health. Said village, borough or city Board shall consist of not less than three (3) members, one (1) of whom shall be a physician, and such physician shall be health officer and executive of the Board, and shall receive such compensation for his services as the council, or other bodies answering thereto, of the village, borough or city shall determine. Said Board shall be elected by the council, or other bodies answering thereto, of each village, borough and city on the first (1) Monday of April, A. D. one thousand eight hundred and eighty-five (1885). One member of such Board shall be elected for and hold such office for the term of three (3) years, one for two (2) years, and one for one (1) year, and one member of such Board shall be so elected annually thereafter, and all vacancies occurring in said Board shall be filled in like manner. It shall be the duty of the health officer to perform and superintend the work prescribed in this act and shall perform such other duties as the Board may require. He shall furnish to the Board such information cognate to this act as from time to time they may deem necessary, and to make once in each year, in the month of May, and oftener if necessary, a thorough sanitary inspection of said town, village, or borough or city, and present a written report of such inspection at the next meeting of the Board of Health, and he shall forward a copy of said report as soon as rendered to the State Board of Health; and he may at any time, when necessary, examine into all nuisances, sources of filth and causes of sickness, and said Board may make such regulations respecting the same as they may judge necessary for the public health and safety of the inhabitants, and every person who shall violate any order or regulation made by any Board of Health, and duly published, shall be deemed guilty of misdemeanor, and pun-

ished by a fine not exceeding one hundred dollars (\$100), or by imprisonment in the county jail not exceeding three (3) months. (As amended by Chap. 4, Laws of 1885.)

SEC. 5. Notice shall be given by the Board of Health of all orders and regulations made by them, by publishing the same in some newspaper, if there is one published in such town. If there is none, then by posting up such notice in five (5) public places therein; and such publications of said orders and regulations shall be deemed a legal notice to all persons.

SEC. 6. Whenever any nuisance, source of filth, or cause of sickness is found on private property, the Board of Health shall order the owner or occupant thereof, at his own expense, to remove the same within twenty-four (24) hours; and if the owner or occupant neglects so to do, he shall forfeit a sum not exceeding fifty dollars (\$50), to be recovered in the name of and for the use of the town, city or village.

SEC. 7. Whenever such owner or occupant shall not comply with such order of the Board of Health, said Board may cause the said nuisance, source of filth, or cause of sickness to be removed, and all expenses incurred thereby shall be paid by the said owner or occupant, or by such other person as has caused or permitted the same.

SEC. 8. Whenever the Board of Health thinks it necessary for the preservation of the health of the inhabitants to enter any building or vessel in their town for the purpose of examining into and destroying, removing or preventing any nuisance, source of filth, or cause of sickness and shall be refused such entry, the health officer or any member of the Board may make complaint under oath to a justice of the peace of his own town, stating the facts in the case so far as he has knowledge thereof.

SEC. 9. Such justice shall thereupon issue a warrant, directed to the sheriff or any constable of the county, commanding him to take sufficient aid, and being accompanied by two (2) or more of the Board of Health, between the hours of sunrise and sunset, to repair to the place where such nuisance, source of filth, or cause of sickness complained of may be, and the same destroy, remove or prevent, under the direction of the members of such Board of Health.

SEC. 10. All Local Boards of Health and health officers shall make such investigations and reports, and obey such directions as to infectious diseases, as shall be directed by the State Board of Health. And any member of any Board of Health, or health officer, who shall neglect to perform the duties required of him under the provisions of this act, or any other act relating to the duties of the Boards of Health or health officers of this State, or who shall neglect or refuse to obey any reasonable directions as to infectious diseases as shall be directed by the State Board of Health shall be liable, upon conviction in any court having competent jurisdiction, to be fined in a sum not less than twenty-five (25) dollars, or more than one hundred (100) dollars, and shall become disqualified from holding the office of a member of the Board of Health.

SEC. 11. When any Local Board of Health are of the opinion that the cleansing and disinfection of any house, building, car, vessel or vehicle or any part thereof, and of any articles therein likely to retain infection, would tend to prevent or check infectious diseases, it shall be the duty of such authority to give notice in writing to the owner or occupier of such house, vessel or vehicle, or part thereof, requiring him to cleanse and disinfect such house, vessel or vehicle and the said articles within a time specified in said notice. If the person to whom notice is so given fails to comply therewith, he shall be liable to a fine of not less than twenty-five (25) dollars nor more than one hundred (100) dollars for every day during which he continues to make default, and said Board shall cause such house, vessel or vehicle and articles to be cleansed and disinfected, and may recover the expenses incurred, and said fine and costs of prosecution in a civil action before any justice of the peace or court having jurisdiction in like cases, which sum when recovered shall be placed to the credit of a special fund for the purpose of said Local Board of Health [to be used] by said Board for general expenses. *Provided*, that where the owner or occupier of any such house, vessel or vehicle is from poverty or otherwise unable in the opinion of said Local Board effectually to carry out the requirements of said Board in said notice, such authority may, without enforcing such requirements on such owner or occupier, with his consent, cleanse and disinfect such premises and articles and defray the expenses thereof.

SEC. 12. Any Local Board may direct the destruction of any bed or bedding, clothing, carpets or other articles which have been exposed to infection from contact with infected persons or articles, and may allow compensation for the same, or may provide a proper place, with all necessary apparatus and attendance for the disinfection of such articles and may cause any articles brought for disinfection to be disinfected thereby, and said Board may provide and maintain when necessary, a carriage or carriages suitable for the conveyance of such

articles or of persons suffering under any infectious disorder, and may pay the expense of conveying therein any person so suffering to a hospital or other place of destination.

SEC. 13. Where any suitable hospital or place for the reception of the sick is provided within the district of any Local Board, or within a convenient distance of such district, any person who is suffering from any dangerous infectious disorder and is without proper lodging or accommodation, or lodged in a room occupied by more than one (1) family, or is on board any vessel, cars or other vehicle, may on a certificate signed by a qualified medical practitioner or the executive officer of said Board, and with the consent of the superintending body of such hospital or place, be removed by order of any justice to such hospital or place at the cost of the local district; and any person so suffering, who is lodged in any common lodging or boarding house, may, with the like consent and on a like certificate, be so removed by order of the Local Board. An order under this section may be addressed to such constable or officer as the justice or local authority making the same may think expedient, and any person who wilfully disobeys or obstructs the execution of said order shall be liable to a fine not exceeding fifty dollars (\$50), to be recovered on criminal complaint, and the sum so recovered shall be paid over to said Board for general expenses thereof.

SEC. 14. The State Board of Health may, by order, require any two (2) or more Local Boards to act together for the purposes of the provisions of this act, for the prevention of epidemic diseases.

SEC. 15. When any person coming from abroad, or residing in any town, village borough or city within this state, is infected, or lately has been infected, with the small pox or other contagious disease dangerous to the public health, the board of health of the town, village, borough or city where such sick or infected person is, may immediately cause such person to be removed to a separate house, if it can be done without danger to his health and shall provide for such person or persons, nurses, medical attendance and other necessities, which shall be a charge in favor of such town, village, borough or city upon the person so provided for, his parents, guardian or master, if able; otherwise upon the county in which he has a legal settlement, or upon the state if such person be a non-resident of the state, and has no property within the state, in which latter case the bills for such expenses shall be paid only after being audited and approved by the State Board of Health and by the Governor, and said bill shall be allowed only on condition that the Local Board of Health shall have promptly, on the appearance of such disease, notified the State Board of Health thereof, and shall have followed the instructions and regulations of said State Board given with respect to the care and expense in the case or cases in reference to which said bills were incurred, and further shall file satisfactory evidence to said State Board that such person or persons were non-residents of the state and have no property within the same. The town, village, borough or city, as the case may be, may recover in a civil action against the person or persons, or the county chargeable under this section.

SEC. 16. If such infected person cannot be removed without danger to his health, the Board of Health shall make provisions as directed in the preceding section for such person in the house where he may be and in such case they may cause the persons in the neighborhood to be removed, and (may take such other measures as they) may deem necessary for the safety of the inhabitants.

SEC. 17. When a disease dangerous to the public health breaks out, the board shall immediately provide such hospital or place of reception for the sick and infected as is judged best for their accommodation, and the safety of the inhabitants, which shall be subject to the regulations of the Board; and the Board may cause any sick and infected persons to be removed thereto, unless his condition will not admit of such removal without danger to his health, in which case the house or place where he remains, shall be considered as a hospital and with all its inmates, subject to the regulations of the Board.

SEC. 18. (1) shall be the duty of all Local Boards of Health, whenever they are informed that there is a case of small-pox, scarlet fever, diphtheria or other infectious or contagious disease within the territory over which it has jurisdiction, to immediately examine into the facts of the case, and if the disease appears to be of the character above specified, they shall adopt such quarantine and sanitary measures as may in their judgment tend to prevent the spread of said disease in its locality, subject to be modified by the State Board of Health, and shall immediately notify the Secretary of said State Board, of the appearance of such disease and the measures adopted by said Local Board in relation thereto.

SEC. 19. And said Boards of Health shall have power to forbid, by notices posted upon the entrances to premises where there may be a patient sick with such disease, any person, except the medical attendants and spiritual advisers, from going to or leaving said premises without their permission, or carrying or causing to be carried, any material whereby said disease may be conveyed, until after said disease has abated and the premises, dwelling and clothing have been rendered free from disease by such disinfecting means as the Board may direct; and if said Board shall be informed that the above, or any reasonable or sanitary measures which they have adopted and made public, is or has been violated, then the said Board may cause said offender against this act to be apprehended and brought before an officer having jurisdiction; and said offender shall, upon conviction, be liable to a fine in the sum of not less than five dollars (\$5) nor more than twenty-five dollars (\$25) for any violation under this act. Any member of any Board of Health who shall neglect his duties under the provisions of this act shall be liable, upon conviction in a court having competent jurisdiction, to be fined in a sum not less than twenty-five dollars (\$25) nor more than one hundred dollars (\$100) for the first offense; and for conviction for violation of this act the second time, shall, in addition to the fines already provided, become disqualified from holding the office of, or to which is attached the duties of a member of a Board of Health.

SEC. 20. All fines collected under this act shall be placed to the credit of a special fund of the city, village or town in which the offense is committed for the use and expenses of said Board. That every physician shall report to the Local Board of Health, in writing, every person having a contagious disease, and the state of his or her disease, and his or her place of dwelling, and name if known, which such physician has prescribed for or attended for the first time since having a contagious disease, or since the discovery of the same to be contagious, during any part of the preceding twenty-four (24) hours; but not more than two (2) reports shall be required in (1) week concerning the same person; but every attending physician thereto must see that such report is or has been made by some attending physician.

SEC. 21. That it shall be the duty of each and every practicing physician in this state to report in writing to the Local Board of Health the death of any of his patients who shall have died of contagious or infectious disease, within twenty-four (24) hours thereafter, and to state in such report the specified [specific] name and type of such disease.

SEC. 22. That every keeper of any private house, boarding-house or lodging-house, and every inn keeper and hotel keeper shall, within twenty-four (24) hours, report in writing to the Local Board of Health the same particulars required of any physician in the preceding section concerning any person being at any of the aforesaid houses and hotels, and attacked with any contagious disease dangerous to the public health.

SEC. 23. That it shall be the duty of every person knowing of any person sick of any contagious disease dangerous to the public health, and the duty of every physician hearing of any such sick person, who he shall have reason to think requires the attention of the Local Board, to at once report to facts to the Board in regard to the disease, condition and dwelling place or position of such sick person.

SEC. 24. That no person shall within the limits of any town, city or village within this state, without a permit from the Local or State Board of Health, carry or remove from one (1) building to another, or from a vessel to the shore, or any railway cars, any person sick of any contagious disease, or the body of any person having died of contagious disease; nor shall any person, by any exposure of any individual sick of any contagious disease, or of the body of such person, or by any negligent act connected therewith, or in respect to the care and custody thereof, or by a needless exposure of himself, cause, or contribute to or promote the spread of disease from any such person or from any dead body.

SEC. 25. That every person being the parent or guardian, or having the care, custody or control, of any minor or other person, shall, to the extent of any means, power or authority of said parent, guardian or other person, that could properly be used or exerted for such purpose, cause and procure such minor or person under control to be so promptly, frequently and effectively vaccinated that such minor or individual should not take, or be liable to take the small pox.

SEC. 26. That no principal, superintendent or teacher of any school, and no parent, master or guardian of any child or minor, having the power and authority to prevent, shall permit any child or minor, having scarlet fever, diphtheria, small-pox or any dangerous, infectious or contagious disease, or any child residing in any house in which any such disease exists, or has recently existed, to attend any public or private school until the Board of Health of the town, village, borough or city shall have given its permission therefor; nor in any manner to be unnecessarily exposed, or to needlessly expose any other person to the taking or to the infection of any contagious disease.

SEC. 27. That no person shall allow to be retained unburied the dead body of any human being for a longer time than four (4) days, or where death has been caused by a contagious disease for a longer time than twenty-four (24) hours after the death of such person, without a permit from the Local Board of Health, which permit shall specify the length of time during which such body may be retained unburied; and when death has been caused by a contagious disease the body shall, if directed by said Board, be immediately disinfected in such a manner as may be directed by said Board and enclosed in a tightly sealed coffin, which shall not thereafter be opened, and the funeral of such person shall be strictly private and in the removal thereof for burial or otherwise hearses or such other vehicles as may be authorized by said Board only shall be employed.

SEC. 28. Said Boards of Health may employ all such persons as shall be necessary to carry into effect the provisions of this act and the regulations duly established by said Boards as herein provided, and may fix their compensation. The said Boards shall have power to employ physicians and provide necessaries for persons in cases of poverty, and generally to pay such expenses as are necessarily incurred by them in taking precautions which they may deem necessary to the public health.

SEC. 29. All expenses so incurred for the control of infectious diseases, etc., by any Town, or Village Board of Health, shall thereafter be authorized by the county commissioner of the district wherein such town or village is situate, and when so authorized shall be audited by the county commissioners, and when so audited, paid out of the county treasury by orders on the treasurer, drawn by the county auditor, and paid out of the general revenue fund of the county, as other claims against the county are paid. All expenses incurred by any City Board of Health, shall, in the first instance, be borne by and paid out of the city treasury. The proper authorities of said city shall certify the amount required to reimburse said city to the county auditor at the time of certifying other taxes, and such auditor shall extend on the tax list of the county a tax sufficient to pay the amount so certified, which tax shall be collected as other taxes and paid over to the treasurer of such city. As amended by Chap. 178, Laws of 1889. Approved April 24, 1889.

SEC. 30. Any person who shall willfully violate any of the provisions of this act, or of any regulations duly made and published by any of the Boards of Health herein mentioned — the penalty for which is not herein specifically provided for — shall be guilty of a misdemeanor; and upon conviction thereof, shall be subject to a fine not to exceed one hundred (100) dollars, or imprisonment not to exceed thirty (30) days, or both such fine and imprisonment. All amounts so collected shall be paid to the town, village or city treasurer and placed to the credit of a special fund for the purposes and expenses of the said Local Board of Health.

SEC. 31. This act shall take effect and be in force from and after its passage; and all acts and parts of acts inconsistent with this act are hereby repealed.

Approved March 3, 1883.



HOW IS A LOCAL BOARD OF HEALTH TO COLLECT EXPENSES FOR CARE OF INFECTIOUS DISEASE OF MEN?

The following law is reprinted in answer to many inquiries:

CHAPTER 176, LAWS 1893:

An act to amend Section 29 of Chapter 132 of the General Laws of 1883, relating to Boards of Health.

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. That section twenty-nine (29) of chapter one hundred and thirty-two (132) of the General Laws of eighteen hundred and eighty-three (1883), as amended, be and the same is hereby amended so as to read as follows:

SEC. 29. It shall hereafter be the duty of the Chairman of any Town or Village Board of Health which has incurred expenses for the control of infectious or contagious diseases in any such town or village, to present a statement thereof duly certified, to the County Auditor of the county in which such town or village is situated, and thereupon it shall be the duty of said County Auditor to place the same before the Board of County Commissioners at their first meeting thereafter; and it shall thereupon be the duty of the said Board of County Commissioners to audit the said statement, or so much thereof as the said Board shall determine to be just and proper. Whenever any Board of County Commissioners shall disallow any such statement, or any part thereof, it shall be the duty of the County Auditor of such county, within ten days thereafter, to notify, in writing, the Chairman of the Town or Village Board of Health, as the case may be, of such disallowance, and such Chairman may thereupon, within thirty days after the receipt of such notice, file with the Clerk of Court a notice of appeal from the action of the said Board of the District Court. When such notice of appeal shall have been filed with the Clerk of Court, as aforesaid, the said Clerk shall place the same upon the calendar of actions for the ensuing term of the District Court. The Court at such term shall fix a day for the hearing of such appeal, and cause notice thereof to be served upon the Chairman of the Town or Village Board of Health, as the case may be. The said Chairman may appear in person or by counsel at the trial thereof. The Court shall render judgment as justice shall require, regardless of the action of said Board of County Commissioners. It shall be the duty of the Clerk of Court to issue subpoenas for the attendance of witnesses when requested so to do, in writing, by the said Chairman. No bond shall be required of the Board of Health taking the appeal herein provided. All expense incident to such appeal shall be allowed by the Court, and paid out of the County Treasury. When the Board of County Commissioners shall audit such statement, or any part thereof, the said statement shall be paid out of the County Treasury by orders on the Treasurer, drawn by the County Auditor, and paid out of the General Revenue Fund of the county, as other claims against the county are paid. All such expenses incurred by any City Board of Health shall in the first instance be borne by and paid out of the City Treasury. The proper authorities of said city shall certify the amount required to reimburse said city to the County Auditor at the time of certifying other taxes, and such Auditor shall extend on the tax list of the county, a tax sufficient to pay the same so certified, which tax shall be collected as other taxes, and paid over to the treasury of such city.

SEC. 2. This act shall take effect and be in force from and after its passage.

Approved April 11, 1893.

AN ACT FOR AN ACT TO PREVENT THE SPREAD OF CONTAGIOUS OR INFECTIOUS DISEASES AMONG "CATTLE," HORSES AND OTHER DOMESTIC ANIMALS.—CHAPTER 200, GENERAL LAWS OF 1885.

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. The Local Board of Health of towns, villages and cities, in case of existence in this State of the disease called Pleuro-Pneumonia among cattle, or Farcy or Glanders among horses, or any other contagious or infectious disease among domestic animals, shall cause the animals in their respective towns, villages or cities, which are infected, or which have been exposed to infection, to be secured or collected in some suitable place or places within their respective towns, villages or cities, and kept isolated; and when taken from the possession of their owners one-fifth (1-5) of the expense of their maintenance shall be paid by the town, village or city wherein the animal is kept, and four-fifths (4-5) by the State; such isolation to continue as long as the existence of such disease or other circumstances may render it necessary.

SEC. 2. The said Local Boards of Health, when any such animal is adjudged by a veterinary surgeon or physician, by them selected, to be infected with any contagious or infectious disease, may, in their discretion, order such diseased animal to be forthwith killed and buried at the expense of such town, village or city.

SEC. 3. The said Local Boards of Health may cause all such animals that have been within the State for six (6) months next preceding the adjudication mentioned in section two (2) to be appraised by three (3) competent and disinterested men under oath, at the value thereof at the time of the appraisal, and in making such appraisal the appraisers shall take into consideration the fact of the existence of such disease, and the amount of the appraisal shall be paid as provided in section one (1), except as provided in section fifteen (15) of this act.

SEC. 4. The said Local Boards of Health may, within their respective towns, villages and cities, prohibit the departure of animals from any inclosure, or exclude animals therefrom.

SEC. 5. The said Local Boards of Health may make regulations in writing to regulate or prohibit the passage from, to or through their respective towns, villages or cities, or from place to place within the same, of any cattle or other domestic animals, and may arrest and detain, at the cost of the owners thereof, all animals found passing in violation of such regulations, and may take all necessary measures for the enforcement of such prohibition, and also for preventing the spread of any disease among the animals to their respective town, village or city, and the immediate vicinity thereof.

SEC. 6. Such regulations shall be recorded upon the records of their respective towns, villages and cities, and shall be published in such towns, villages and cities, in such manner as may be provided in such regulations.

SEC. 7. Any person disobeying the orders of said Local Boards of Health, made in conformity with the preceding provisions, or driving or transporting any animals contrary to the regulations made, recorded and published as aforesaid, shall be punished by a fine of not less than one hundred (100) dollars, nor exceeding five hundred (500) dollars, or by imprisonment of not less than thirty (30) days, nor exceeding one (1) year.

SEC. 8. Whoever knows or has reason to suspect the existence of any such disease among the animals in his possession, or under his care, shall forthwith give notice thereof to the said Local Board of Health of the town, village or city where such animals are kept, and for failure so to do shall be punished by a fine of not less than fifty (50) dollars, nor exceeding five hundred (500) dollars, or by imprisonment of not less than thirty (30) days or more than (1) year.

SEC. 9. Any member of any Local Board of Health who neglect or refuse to carry into effect the preceding provisions shall be punished by a fine of not less than one hundred (100) dollars, nor more than five hundred (500) dollars for each day's neglect.

SEC. 10. When the State Board of Health make and publish any regulations concerning the extirpation, care or treatment of animals infected with, or which have been exposed to, any contagious disease, such regulations shall supersede those made by the Local Boards of Health; and said Local Board of Health shall carry out and enforce all orders and directions of the State Board of Health to them directed.

SEC. 11. The State Board of Health, shall have all the power and authority herein conferred upon Local Boards of Health.

SEC. 12. The Local Boards of Health, within twenty-four (24) hours after they have notice that any domestic animals in their respective towns, villages and cities are infected with or have been exposed to any such disease, shall give notice thereof in writing to the State Board of Health.

SEC. 13. The State Board of Health may make all necessary regulations for the quarantine of such animals, and extirpation of such disease, and may direct Local Boards of Health to enforce and carry into effect all such regulations as may from time to time be made for that end; and any member of any Local Board of Health who refuses or neglects to enforce or carry out any regulation of the State Board of Health shall be punished by a fine of not less than one hundred (100) dollars nor more than five hundred (500) dollars for every offense.

SEC. 14. The State Board of Health, when, in their judgment the public requires it, may cause to be killed and buried any domestic animals which are infected with, or have been exposed to, such disease; and except, as provided in the following section, shall cause such animals to be appraised in the manner provided above, and the appraised value of such animals shall be paid, one-fifth (1-5) by the town, village or city in which such animals were kept, and the remainder by the State.

SEC. 15. In all cases of farcy or glanders, the State Board of Health, having condemned the animal infected therewith, shall cause such animal to be killed, without an appraisal or compensation to the owner thereof, but may pay the owner an equitable sum for the killing and burial thereof.

SEC. 16. Any person who fails to comply with the regulation made, or an order given by the State Board of Health, shall be punished by fine not exceeding five hundred dollars (\$500) or by imprisonment not exceeding one (1) year.

SEC. 17. All appraisals made shall be in writing and signed by the appraisers and certified by the Local Boards of Health or State Board of Health respectively, to the governor and to the treasurer of the several towns, villages and cities wherein the cattle appraised were kept.

SEC. 18. The State Board of Health may examine, under oath, all persons believed to possess knowledge of material facts concerning the existence or dissemination or danger of dissemination of disease among domestic animals; and for this purpose shall have all the power vested in justices of the peace to take depositions and to compel witnesses to attend and testify. All costs and expenses incurred in producing the attendance of such witnesses shall be

certified by the State Board of Health and paid from the treasury of the State upon being certified to and approved by the governor.

SEC. 19. Whenever animals are exposed to contagious diseases or killed by an order of the State Board of Health, and upon a post-mortem examination are found to have been entirely free from disease, the State Board of Health shall cause the same to be sold under their direction, first giving to the purchaser notice of the facts, and if said purchaser, or any other person, shall sell said slaughtered animals, or any part thereof, he shall in like manner give notice to the parties to whom such sales are made, and the proceeds of the sales, made by order of the State Board of Health, shall be applied in payment of the appraised value of said animals.

SEC. 20. Whoever violates any of the provisions of the preceding section shall be punished by fine not exceeding one hundred dollars (\$100) and the cost of prosecution.

SEC. 21. The State Board of Health shall keep a full record of their doings and report the same to the legislature unless sooner required by the governor.

SEC. 22. The State Board of Health may, by order, require any two (2) or more Local Boards to act together for the purposes of this act.

SEC. 23. The sum of three thousand dollars, (\$3,000,) or so much thereof as necessary is hereby annually appropriated for the payment of expenses incurred by the State in enforcing this act; said expenses to be approved by the State Board of Health and by the governor.

SEC. 24. This act shall take effect and be in force from and after its passage.

Approved March 7, 1885.

AN ACT TO REGULATE OFFENSIVE TRADES AND EMPLOYMENTS—CHAP. 222, LAWS OF 1885.

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. The Board of Health of each town, village or city in this State, shall, from time to time, assign certain places within such town for the exercise of any trade or employment which is a nuisance or hurtful to the inhabitants, or dangerous to the public health, or the exercise of which is attended by noisome or injurious odors, or is otherwise injurious to the estates of such inhabitants; and may prohibit the exercise of such trade or employment in places not so assigned. Said Board may also forbid such exercise within the limits of the town or particular locality thereof. All such assignments shall be entered in the records of the town and may be revoked when said Board shall think proper.

SEC. 2. It shall not be lawful for any person or corporation to exercise within any town, village or city, any trade or employment mentioned in section one (1) of this act, without having first obtained from the Board of Health of such town, village or city, permission so to do, and the assignment provided in said section; and any person or corporation violating the provisions of this section shall forfeit and pay the sum of fifty dollars (\$50) for each and every day that any such trade or employment is exercised or carried on, to be recovered in any court having jurisdiction thereof, and sitting within the county where any such trade or employment is exercised or carried on; such action shall be commenced and prosecuted by such Board in its name and for its benefit.

SEC. 3. When any assignment mentioned in section one (1) hereof shall be revoked, said Board shall serve upon the occupant, corporation or person having charge of the premises where such trade or employment is exercised a written notice of such revocation. If the person or corporation upon whom such order is served, for twenty-four (24) hours after such service, refuses or neglects to obey the same, said Board shall take all necessary measures, by injunction, or otherwise, to prevent such exercise; and the person or corporation so refusing, or neglecting, shall forfeit and pay the sum of one hundred dollars (\$100) for each and every day that such trade or employment shall be exercised after the service of such notice, to be recovered in the manner and by the party and for the benefit as provided in section two (2) hereof.

SEC. 4. Any person or corporation aggrieved by any order of such Board, may appeal therefrom to the district court of the county in which such trade or employment is exercised. Such appeal shall be taken by the filing of such aggrieved person or corporation, within five (5) days after the service of such order, in the office of the clerk of said court, of a notice of such appeal, together with a bond in the sum of not less than five hundred (\$500) dollars, with two (2) or more sureties, to be approved by the judge of said court, conditioned for the prosecution of such appeal to judgment and for the payment of all costs and expenses that may be awarded against such appellant, and by the service of a copy of such notice and bond upon such Board. If such appeal be taken within twenty (20) days next before the time appointed for holding a general term of said court within said county, the same shall be heard at such time as other civil causes, and at the request of either party, shall be tried by jury. If such appeal is taken more than twenty (20) days before any such term, the judge shall, by order, appoint a time and place for the hearing of such appeal, and shall, if the appellant demand a trial by jury, direct the sheriff of such county, to summon a jury of twelve (12) persons having the qualifications of jurors, to appear at the time and place named in said order, to serve as jurors in said cause. Any person so summoned do not appear, the court shall require talesmen to be called as in other cases, and said appeal shall be tried as other civil causes. During the pendency of such appeal, such trade or employment shall not be exercised contrary to the order of said Board; and upon the violation of any such order the appeal shall forthwith be dismissed. Upon the return of the verdict of the jury the court may either affirm or amend the order of the Board or affirm or amend it in full, to conform to such verdict. If the matter be tried by the court it shall have and exercise the same power.

SEC. 5. Any person injured, either in his comfort or the enjoyment of his estate, by the exercise of any such trade or employment may have and maintain an action for the damages sustained thereby.

SEC. 6. When it appears on a trial before the district court for the proper county, upon a complaint made by any person that any place or building assigned as provided in section one (1) of this act has become a nuisance by reason of offensive smells or exhalations proceeding from the same, or is otherwise hurtful or dangerous to the neighborhood, or to travelers, said court may revoke such assignment and prohibit the further use of such place or building for the exercise of either of the aforesaid trades or employments, and may cause such nuisance to be removed or prevented.

SEC. 7. When any building or premises within any city, village or town are occupied or used for the exercise of any trade or employment aforesaid, the State Board of Health shall, upon application made to it for that purpose, appoint a time and place for hearing the parties, and give notice of not less than ten (10) days thereof to the complainant and the party against whom such application is made, and after such hearing may, if in its judgment the public health or the public comfort and convenience so require, order any person to desist and cease

from further carrying on such trade or occupation in such building or premises; and any person or corporation thereafter continuing to occupy such building or premises, shall forfeit and pay the sum of one hundred (100) dollars for every day of such occupancy or use, to be recovered in any court having jurisdiction thereof by action commenced and prosecuted in the name of the Board of Health of such city, village or town, and for its use and benefit. Any person or corporation aggrieved by any such order, may appeal therefrom, and said appeal shall be taken, prosecuted and determined in the same manner provided in section four (4) of this act. During the pendency of such appeal, such trade or employment shall not be exercised contrary to the orders of said State Board, and upon the violation of [any] such order, the appeal shall forthwith be dismissed.

SEC. 8. The district court, or the judge thereof, may issue an injunction or other proper writ, to enforce the orders of said State Board, issued under the provisions of this act.

SEC. 9. Nothing in this act contained shall be construed as to impair any other remedies which may exist in cases of nuisance.

SEC. 10. This act shall take effect and be in force from and after its passage

Approved March 7, 1885.

AN ACT TO PREVENT THE POLLUTION OF RIVERS AND SOURCES OF WATER SUPPLY.—CHAPTER 225, LAWS OF 1885.

Be it enacted by the Legislature of the State of Minnesota.

SECTION 1. No sewage, drainage or refuse or polluting matter of such kind as either by itself or in connection with other matter will corrupt or impair the quality of the water of any spring, well, pond, lake, stream or river for domestic use, or render it injurious to health, and no human or animal excrement shall be placed in or discharged into, or placed or deposited upon the ice of any pond, lake, stream or river, used as a source of water supply by any town, village or city; nor shall any such sewage, drainage, refuse, or polluting matter or excrement be placed upon the banks of any such pond, lake, stream or river, within five miles above the point where such supply is taken, or into any feeders or the banks thereof, of any such pond, lake, stream or river:

SEC. 2. The State Board of Health shall have the general supervision of all springs, wells, ponds, lakes, streams or rivers used by any town, village or city as a source of water supply, with reference to their purity, together with the waters feeding the same, and shall examine the same from time to time, and inquire what, if any, pollution exist, and their causes. In case of a violation of any of the provisions of section one (1) of this act, said Board may appoint a time and place for hearing parties to be affected, and shall give due notice thereof, as hereinafter provided, to such parties, and after such hearing, if in its judgment the public health requires it, may order any person or corporation, or municipal corporation to desist from the acts causing such pollution, and may direct any such person or corporation to remedy the pollution, or to cleanse or purify the polluting substance, in such a manner and to such a degree as shall be directed by said Board, before being cast, or allowed to flow into the waters thereby polluted, or placed or deposited upon the ice or banks of any of the bodies of water in the first section of this act mentioned. Upon the application of the proper officers of any town, village or city, or of not less than legal voters of any such town, village or city, to said State Board, alleging the pollution of the water supply of any such town, village or city, by the violation of any of the provisions of this act, said State Board shall investigate the alleged pollution, and shall appoint a time and place, when and where it will hear and examine the matter, and shall give notice of such hearing and examination to the complainant, and also to the person or corporation, or municipal corporation alleged to have caused such pollution, and such notice shall be served not less than ten (10) days prior to the time so appointed, and shall be served in the same manner that now is, or hereafter may be, by law provided for the service of a summons in a civil action in the district court. Said Board, if in its judgment any of the provisions of this act have been violated, shall issue the order or orders already mentioned in this section.

SEC. 3. The district court, or the judge thereof, may, upon the complaint of said State Board, or of the proper authorities of any town, city or village whose sources of water supply shall be so polluted, issue an injunction to enforce the orders of said State Board.

SEC. 4. Such orders of the State Board shall be served upon the persons, corporations, or municipal corporations found to have violated any of the provisions of this act, and any party aggrieved thereby, shall have the right to appeal to the district court of the county in which is situate the town, village or city whose source of water supply is found to have been polluted, and such aggrieved party shall have the right to a trial by jury in the same manner as in a civil action in said court. During the pendency of the appeal, the pollution against which the order has issued, shall not be continued contrary to the order of the State Board, and upon the violation of the order the appeal shall forthwith be dismissed.

SEC. 5. Any person, corporation or municipal corporation desiring to appeal from any such order of the State Board, shall, within thirty (30) days after the service upon him or it of a copy of such order, file in the office of the clerk of the district court of the proper county, a notice of such appeal, together with a bond in the sum of not less than two thousand (2,000) dollars, with two (2) sureties, to be approved by the judge of said court, conditioned for the prosecution of such appeal to judgment, and for the payment of all the costs and disbursements that may be adjudged against him or it therein, and shall, within three (3) days after such filing, serve a copy of such notice and bond upon the Secretary of said Board; and said Secretary shall, within ten (10) days thereafter, deliver such copies so served upon him to the mayor or other chief executive officer of any such city, village or town, whose source of water supply has been found to have been so polluted.

SEC. 6. Water boards, water commissioners, water companies, and the proper officers of any city, village or town, making use as a source of water supply, of any well, spring, pond, lake, stream, river, reservoir or well, within, or partly within, this State, and distributing the waters thereof for public, domestic and general uses, shall, from time to time, and whenever required by said State Board, make returns to said Board, upon blanks to be furnished by it, of such matters as may be required by said Board and called for by such blanks, and any such water board, water commissioners, water company, or officers of any city, village or town, who shall, for the space of thirty (30) days after being furnished with such blanks, fail or neglect to make any such report so required, shall, for each and every such neglect or failure, forfeit and pay the sum of one hundred (100) dollars, for the use of the Local Board of Health, or the proper officers acting as such, of the city, town or village where such delinquent has its principal office. Said State Board shall, in the name of the State, prosecute in the district court of the proper county an action for the recovery of the penalty or forfeit herein imposed.

SEC. 7. This act shall take effect and be in force from and after its passage.

Approved March 7, 1885.

An Act to Provide for the Collection of Vital Statistics.

Be it enacted by the Legislature of the State of Minnesota.

SECTION 1.—The Clerk of each town, and the Health Officer of each village, borough or city in this State, shall obtain and register the following facts concerning the births and deaths occurring therein, separately numbering and recording the same in the order in which he obtains them, designated in separate columns, viz: In the registry of births, the date of birth, the name of the child (if it have any), the sex and color of the child, the names and places of birth of the parents, and the date of the record; in the registry of deaths, the date of death, [the name of the deceased,] the sex and color, the condition, whether single, widowed or married, [the age, place of birth,] the names and places of birth of the parents, the disease or cause of death, and the date of the record. The County Auditor of each County shall furnish each clerk or Health Officer within his County, at the expense of the County, a book in which to register the facts concerning the births and deaths as above provided. Provided, however, that in cities of over 100,000 inhabitants, where the duties hereby imposed upon the Health Officer, have heretofore been imposed upon the City Clerk, the latter shall continue to perform the same and receive the compensation therefor.

SEC. 2.—Parents shall give notice to such Clerk or Health Officer, of the births and deaths of their children; every householder shall give like notice of every birth and death happening in his house; the oldest person, next of kin, shall give such notice of the death of his kindred; the keeper, or other proper officer, of every workhouse, poorhouse, reform-school, jail, prison, hospital, asylum, or other public or charitable institution, shall give like notice of any birth or death happening among the persons under his charge. Whoever neglects or refuses to give such notice for the period of ten (10) days after the occurrence of a birth or death, shall forfeit a sum not exceeding twenty (20) dollars, to be collected as other fines are collected by law.

SEC. 3.—Any physician having attended a person during his last illness, shall, within ten (10) days after the decease of such person, furnish for registration to such Clerk or Health Officer, a certificate of the duration of the last illness, the name of the deceased, his age, the disease of which the person died, and the date of his decease. And any physician or midwife having attended a case of confinement, shall, within ten (10) days thereafter, furnish for registration to said Clerk or Health Officer, a certificate of the date of birth, sex and color of the child, with the names, dates and places of birth of the parents. If any physician or midwife neglects to make such certificate, he shall forfeit the sum of twenty-five (25) dollars, to be collected as other fines are collected by law.

SEC. 4.—Such Clerk, or Health Officer, shall, on or before the fifth (5) day of each month, transmit to the Secretary of the State Board of Health and Vital Statistics, upon blanks to be furnished by said Board, a certified copy of the registry of births and deaths which have occurred within such town, village, borough or city, during the calendar month immediately preceding. For obtaining, registering and returning the facts herein required, such Clerk or Health Officer shall be entitled to receive from the County Treasury of his County, twenty-five (25) cents for each birth or death so obtained, registered and reported. And for neglect to perform such duties as herein required, he shall forfeit a sum not exceeding fifty dollars for each offense, to be collected as other fines are collected.

SEC. 5.—It shall be the duty of the State Board of Health and Vital Statistics, to prepare and furnish to such Clerks and Health Officers, suitable blanks and instructions for the making of the returns herein provided for. And the Secretary of said State Board of Health and Vital Statistics, shall, annually, on or before the fifteenth (15) day of January, of each year, transmit to the Clerk of the District Court, of each County, all of the said returns received by said Secretary from such Clerks or Health Officers, in such County during the year ending on the last day of the preceding December, together with his certificate showing the aggregate number of births and deaths so reported in such year by each such Clerk and Health Officer.

SEC. 6.—The said Clerk of the District Court shall thereupon file the said returns so to him transmitted, in his office, and shall also issue to each such Town Clerk and Health Officer a certificate showing the amount due to them respectively, for the obtaining, registering and reporting the births and deaths aforesaid, as the same may appear from the said certificate of said Secretary of the State Board of Health and vital statistics. For all his said services, such Clerk of the District Court shall be entitled to receive from the County Treasurer of his respective county for recording such births and deaths, and making such abstract thereof as he may by law be required to make the sum of ten (10) cents for each such birth or death. And for his failure to perform any of the duties herein provided for such Clerk of the District Court, shall forfeit the sum of fifty (50) dollars, to be collected as other fines are collected.

SEC. 7.—The County Auditor of each County, upon the presentation to him of the aforesaid certificate of the Clerk of the District Court of his County, shall issue and deliver to each Clerk and Health Officer, respectively, his warrant upon the County Treasurer for the amount in said certificate stated to be due to such Clerk or Health Officer, and the County Treasurer upon the presentation of such warrant, shall pay the same to the person entitled thereto out of the general funds of the County Treasury.

SEC. 8.—To cover all Clerk hire, stationery and incidental expenses of the State Board of Health and Vital Statistics, under this act, the sum of one thousand (1,000) dollars shall be and hereby is annually appropriated.

SEC. 9.—Sections 81, 82, 83, 84 and 85 of Chapter six (6) of General Statutes of 1878, and all other acts and parts of acts inconsistent with this act, are hereby repealed.

SEC. 10.—This act shall take effect and be in force from and after its passage.

Approved March 8th, 1887.

MEMORANDUM AND MODEL PLAT.

THE MAY SANITARY INSPECTION
OF CITIES, VILLAGES AND
TOWNS.

The law requiring this inspection reads as follows:

"He (the Health Officer) shall make once a year in the month of May, and oftener if necessary, a thorough sanitary inspection of said town, village, borough or city, and present a written report of such inspection at the next meeting of the Board of Health, and he shall forward a copy of said report as soon as rendered to the State Board of Health." Chap. 4, Laws of 1885, Sec. 2.

The compelling fact of all sanitary work and methods in any centre of population, whether a family or many families, in township or city, is the constant production and presence of decomposing organic matter, where it is a perpetual menace to the purity of all water and food supplies to men, women and children.

Outside of the waste products of offensive trades and manufactures, the dangers from this organic matter are centered in the common receptacles of such matter, the privy, the cesspool, the manure heap and the kitchen sloop and garbage pile. Common experience and the scientific study of the relation of these things to disease prove them to be very often the carriers of the specific cause, and always to be important.

They are themselves easily accessible, and may be prevented or regulated by the enforcement of existing laws.

Common experience shows further that the individual owners of these things rarely appreciate their danger to their neighbors or to themselves; and that "the hole in the ground," privy and cesspool, are the rule rather than the exception in all places where connection with, and use of, a public sewer system are not obligatory.

Most other sources of danger to health, in or on the soil, to be discovered by the May inspection are directly related to these, and so to discover their presence and extent is the first object of the May sanitary inspection. A very common popular mistake (and one not confined to non-professional people, either,) is to suppose or act as if they believed that clean streets and alleys were any proof that the city or village where they are is clean, for it is self-evident that streets and alleys may be clean while the adjacent houses and lots are filthy and unhealthy by reason of the abominations above referred to.

The first duty, therefore, of a health officer, is to know the whereabouts and have a record of every privy, cesspool, manure heap, sloop and garbage pile in the community; because foreknowledge of these conditions gives the most important of the local factors of disease, and suggests the first steps for prevention or control.

THE MOST IMPORTANT POINTS TO BE LOOKED AFTER
IN THE ANNUAL INSPECTION.

1. The number, construction, condition and location of all privies, cesspools or other collections of fluid or semi-solid filth.

2. The location and character of all other collections of refuse, animal or vegetable matter, now, or likely to become a nuisance or cause of sickness.

3. The location and construction of wells and cisterns; their condition, and that of other sources of water supply, for public or family use; the source of the water, and, in case of disease or reasonable suspicion of its qualities, its examination. Springs and wells are to be studied, particularly with reference to 1 and 2.

4. The character, capacity, construction and efficiency of all drains, sewers, or other apparatus or methods of disposing of slops and other fluid refuse.

5. The condition of lots (inhabited or not), streets and alleys, as respects drainage and cleanliness.

6. The location of all trades or employments "dangerous to the public health, or a nuisance; or attended by noisome or offensive odors, or otherwise injurious to the estates of the inhabitants." These trades are chiefly butcher shops, slaughter houses, stock barns, sheds or yards, hog pens, dairies and creameries. (Chapter 222, Laws 1885.) Please report particularly the number, character and condition of these trades. The condition of stockyards to be carefully investigated.

7. The care and diseases of domestic animals, the condition of the barns, sheds or pens occupied by them, as affecting their health, and any other facts bearing upon public health. For example, milk supply, condition for slaughter of animals intended therefor, infectious disease. (Chapter 200, Laws 1885.) Look out carefully for any form of tuberculosis in milch cows, and report suspected cases.

8. The public or private disposal of night soil, garbage, offal or other vegetable or animal refuse.

9. The condition, purity and abundance of the public water supply.

10. The same facts as to the public sewer system.

11. The sanitary condition of buildings used for public assemblies, particularly school houses and places of amusement.

12. Sanitary condition of hotels, common boarding and tenement houses, hospitals, poor houses, jails, lockups, livery stables, railway station houses and stockyards.

13. Stagnant pools, swamps or marshy lands adjacent to residences, or liable to affect, injuriously, the public health.

14. The condition of ponds, lakes or streams, used in common by two or

more sanitary districts. In case cause for complaint is found it should be made first to the authorities of the district, and if not attended to, to the State Board.

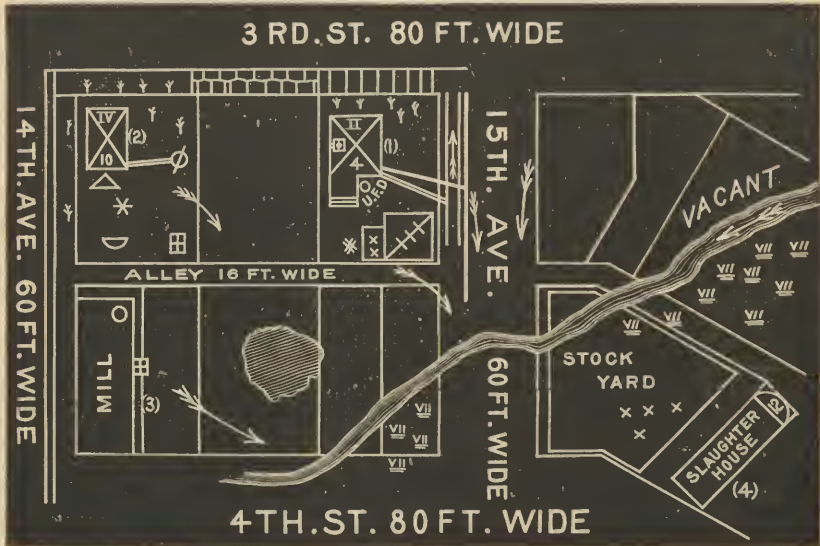
15. In case of cause for complaint against railroads the Local Board should submit, in writing, to the Local Agent such order as it finds necessary to make, just as to any other person. If not attended to, report the order and evidence to the State Board.

Copies of this and all other circulars of this Board can be had by writing to the Secretary at St. Paul. C. N. H.

The following model plat for recording facts of inspection can be drawn with pencil on a half sheet of letter paper making a convenient record which can be changed as occasion requires.

To be used in making and recording a sanitary survey of a farm, lot or block (as the case may be), as parts of a township, village or city survey. (The signs illustrated and described below enable the record to be made with the minimum of notes.)

NO. OF PLAT.....



1. House; Roman numeral (e. g., II) indicates adult population. Arabic (e. g., 4), child population. Number in parenthesis (e. g., I), reference number of house.
2. Well; if used for drinking purposes, mark u. f. d.
3. Water or earth closet.
4. Privy, with ordinary vault; see 23 below.
5. Cistern; if used for drinking purposes, mark u. f. d.
6. Cesspool and drain from house.
7. Garbage heap.
8. Barn; marks on diagonal indicate horses and number of same.
9. Shed; marks indicate cattle and number of same.
10. Manure heap.
11. Pig pen; numeral (e. g., 9) indicates number of occupants.

12. Plank sidewalk.
13. Stone, brick or concrete sidewalk.
14. Water main and connection with house; arrow indicates direction of flow.
15. Sewer and connection with house; arrow indicates direction of flow.
16. Swamps or wet ground.
17. Flowing stream.
18. Stagnant pool.
19. Trees.
20. Arrow indicates direction of surface drainage.
21. U. F. D., used for drinking purposes.
22. Ft. D., followed by numeral, indicates number of feet deep.
23. W. T., means water tight.



DOMESTIC HYGIENE,

OR, SPRING WORK FOR HEALTH IN AND ABOUT THE HOME.

NOTE.—Please preserve this circular. Copies can be procured of any Local Board of Health, and of Dr. Hewitt, Secretary, Red Wing.

SPRING is, by common consent, the season for house cleaning, and for “clearing up” in back-yards, front-yards, and streets. It is also the time for beginning the campaign against ill-health, sickness, and premature death, which will “have their best innings” from spring till frost.

Cholera Infantum—a specific disease of the bowels in children—will begin its attacks with energy in June, attain an enormous prevalence in July and August, and a very rapid fall in September. The cause of this disease is closely related to filth of soil, foul air and water, in which, with the high temperature of summer, it finds a congenial hot-bed for a prolific and malignant growth. Children under five years of age are by far the greatest sufferers, and the dreadful fact that this poison finds them in their homes, makes the discovery of its mode of attack and destruction a matter of vital importance, particularly to every mother.

44.9% of all deaths in Minnesota in the average of four years are of children under five years of age, and 31.6% are children under one year of age. What better evidence that the causes of death find them in their homes?

The hot season is the one for rapid growth, maturity, and decay in the vegetable kingdom, to which most of the specific causes of diseases, at present known, belong. Decay is at this season still more rapid, offensive, and dangerous. In the natural order of things decay is the natural helper of the growth of all forms of vegetable life on the condition that the dead thing is properly buried or burned, a condition difficult to secure in houses and centres of population, just in proportion as they are crowded, and the simple sanitary precautions, to be mentioned, are neglected.

The sanitary duties, in and about the home, from now to winter, may be summed up, from our present standpoint, to be very largely the supply of those conditions whereby dead organic matter may be excluded from the air, breathed in, water drank in, and the house occupied by, every home of our population.

But how? is the natural question. As the mother is the proper *Health Officer of the home* what is to follow will be addressed to her, but with the distinct understanding that it concerns the father of the family as well, and that it applies as much to the isolated farm house as to the houses of villages and cities, for the problem is, *How to prevent the occurrence of ill health, sickness, and premature death in the family.*

In beginning anything, it is best to know first what needs to be done, and in this case the first thing is a careful inspection of the house, and everything in it from top to bottom, with all its belongings, out-buildings, and lot, to find every cause which may foul the air or water supply, or be a breeding place for the germs of disease, or a lodging for preventible nuisance.

Begin with the cellar, which, in winter and cool weather, is, as a rule, the lungs of the house. It should be light and dry, and all summer long, have a free through and through ventilation. See that no decaying vegetable or animal matters are allowed there. Keep potatoes and other vegetables in boxes or barrels small enough to be moved readily. Have no fixtures there, but have closets, milk-safes, and the like, readily movable, and keep them away from the walls. It *pays* to have a *cement, or better, an asphalt, floor.* If well made it can be thoroughly washed; it helps to keep out moisture, ground air, and vermin, and can be cleaned as readily as stone, and better than wood. Stone or hard brick in cement or asphalt will do. Soft brick are bad; and wood, on the soil, very bad—the bare soil is better than that. *Cellar walls* should be coated with *fresh and caustic* milk of lime (true white-wash), *ceilings* to be treated in the same way if practicable, and always kept free from cobwebs and dirt. A *damp and musty odor* should never be tolerated in the cellar air. Keep it sweet and pure for the very simple but important reason, that it *determines very largely the character of the air of the house.*

The house itself.—All floors should be well jointed, tight, smooth, and saturated with boiled linseed oil, or painted; but the oil is best to prevent fouling by offensive matters, which must happen to a floor not so protected. A well-made floor, smooth, and well oiled, is so slightly, and easily cleaned, and kept clean, that carpets, except as movable rugs, are unnecessary. *The carpet*, as commonly used, cut to the size of the floor and tacked down for months at a time, always retains filth in and under itself, which the most careful sweeping will not remove. *The rug*, home-made or bought, is cheaper, cleaner, healthier, easily aired, dusted, or cleaned, and, fortunately, is now fashionable.

The walls of rooms should be lime-washed in simple colors, or painted.

Wall paper and kalsomine are retainers of offensive matter; the cheap glue of the one, and the paste used to put on the other, are very liable to decay. All house-keepers know what a job it is to remove them, which must be done before another application. Arsenic is common in many wall papers, and has caused sickness in such combination; therefore, for health, use lime-wash or paint on room walls. If the last, it should be thin, and a rapid dryer.

As to ceilings, they should not be painted or papered. Better lime-wash them. Part of the ventilation of rooms is (if permitted) through the ceiling into the garret, or the space between joists and thence to the garret.

Closets and clothes presses readily, and usually, become dirty, musty, and offensive. The musty odor here and elsewhere in inhabited places, is caused by the decay of organic matter. It is due to a vegetable growth, microscopic in size, and for that reason all the more readily floated in the air and breathed. Destroy it by cleanliness, dryness, ventilation, and light.

Winter clothing should be well shaken and thoroughly aired out of doors before packing away. Old boots, shoes, and the like, should go to the repair shop, to the compost heap, or be buried near the roots of vines or trees.

Bed rooms and bedding.—Sleeping rooms are best off the ground floor. For *mattresses*, hair leads, of course; next may be put fresh and bright oat straw. For cover, nothing equals the *all-wool* blanket, no matter how coarse

its texture. The "comforter,"—*i. e.*, cotton-batting as a filling between two layers of cotton cloth—is, as usually made, a very poor substitute, a retainer of foul odors, and in case of infectious disease, dangerous. It is difficult to wash, and in too many instances is permitted to go unwashed. A better plan for a comforter is to replace the cotton-batting with washed and carded wool. Thin, light, tidy, and warm; it is almost the equal of the eider-down quilt. For summer use, light, *all-wool* blankets, with a neat Marseilles or calico spread are best. *Always use sheets* on the bed, as you wear underclothing on the body.

Beds should be shaken up and exposed to the open air and sunlight for an hour in the forenoon; windows and blinds open, too, for a free ventilation. Bed rooms, for summer use, should be uncarpeted and contain no more furniture than is useful. *Cleanliness, ventilation, and sunlight* are even more important here than in other rooms. Iron beds and wire mattresses are nearly as cheap, and much healthier than wood.

The garret should be treated as a closet, through which much of the vitiated air of the house finds its way to the outside; therefore, be sure that it has windows and is well lighted. Leave its windows wide open the season through. Put in bars if you please; but its free ventilation makes the house cooler in summer and its air purer in winter.

Cisterns and wells should never be placed inside the foundation walls of houses. If there, shut off moisture and odor, by covering with stone and cement and putting the manhole outside the walls.

Cisterns are best made egg-shape, the small end up, cemented inside and out, if of brick or stone. If dug out in solid clay, a strong wall of cement as a lining is enough. The egg-shape is not only the strongest, but it collects sediment in a small area of the bottom, and permits room only for manhole and pipes at the top, thus excluding vermin and filth. *Filtration of rain water* is better done before it enters the cistern, if practicable. The difficulty with a filter inside, is its cleaning. It may be of brick, filled with charcoal broken up small and free from dust, or better of sand and gravel, but not under water. It should be well above the bottom, and easily removable for cleaning. *A filter is worse than useless if not frequently cleaned.* The delivery pipe should go within a foot of the bottom and turn up so that the incoming water may not stir up the sediment. Cisterns should be cleaned after the first spring rain (which washes the roof) and after the fall of the leaves in autumn.

Wells and well water.—A "surface water" well is always liable to be soiled by the surface washings from house-slops, manure, and the privy vault. The same danger threatens any well from which surface water is not shut out by cemented walls, or better, by sealing the pipe in clay or stone, and bringing it up well above the surface of the ground. Artesian, or drilled wells, treated in this way, as a rule (in Minnesota), afford pure and good drinking water.

Sources of impurity to air and water outside the house are, in order of importance, the *privy vaults, house slops, manure piles, and garbage.* The first should be cleaned and its contents taken to cultivated land; then fill up the hole with clean earth, put an earth closet in its place and determine that

never again will you permit that nuisance on your property. (Estimates and drawings of improved earth closets for in, and out-door use, will be furnished on application to the Secretary at Red Wing or any Local Board of Health.)

The manure pile should always be placed where it will drain away from the well. If that cannot be, put it on a bed of well tamped clay, and under cover. In any case it should be removed to the land as frequently as possible.

Scraps from the kitchen, vegetable or animal, not fed to animals, should be regularly burned in the kitchen stove, or buried in the garden.

House slops, soap suds, etc., in the absence of public sewers, should be drained off through a tight pipe into the garden and distributed through loose drains of tile or stone, 20 inches under the service. The entrance to this sewer should be *outside* the foundation of the house and covered with an iron or other grating. This pipe should have an additional cover of straw in winter to prevent freezing.

Barns, cow stables, and other places occupied by animals, should be kept clean. *Dry garden earth*, mould, clay or peat well pulverized, used freely on the floor of the stalls, not only destroys odors, but saves the ammonia and makes the richest and most valuable of manures for the garden.

Streets and alleys.—Their sanitary care is the legal duty of Local Boards of Health, and they must not be used for the deposit of litter, manure, slops, or other offensive matters. If those near the home are so used, complain to the Board of Health, who will give the matter prompt attention.

Trees and shrubbery, if not so near and dense as to make their shade damp, are of advantage. They should be trimmed high enough to permit a free circulation of air over the soil, which they help to drain and aerate.

Fragrant flowers and shrubs.—When possible, always have a garden of such, as well as a vegetable garden. Encourage the children to help in their care. Many a mother and daughter have found health and color in this pleasant labor, and very many more need just this variety to the monotony and confinement of household duty. *The summing up of the whole matter, therefore, is, abundant pure air, fresh water, and bright sunlight, within as well as without, the house, the essential foundation of healthy personal and family life.*

Here is our formula for lime-water and lime-wash—always keep a large crock of it ready for use, and make free use of it on cellar walls and house ceilings, and in and about all out-houses and barns. It is of no use unless *fresh*, either for whitewash in or outside the house. The kerosene keeps it fresh and caustic—by excluding the air—for a long time.

Lime-water is the clear solution of *quick-lime*. Take best quick-lime in lumps, put in a pail, pour on one-third as much of water, cover closely and slack till it is a fine powder or creamy fluid; one part of this to three of water will make a saturated solution. Add water in that proportion to the mixture, stir well and then pour on half tea-cup of kerosene, which will protect it from the air and preserve its strength. Use the clear solution as needed, and the solid matter can be made into whitewash or thrown into the sewer or out-house.

THE DRY EARTH CLOSET.

The Natural Method of Disposing of Excreta and Other Decaying Organic Matters by Earth Burial, and a simple Modification Adapted to Domestic use.

IT is a curious and serious illustration of the difference between belief and practice that, while most intelligent people readily admit the present methods of disposing of excreta and other organic refuse of family life by "holes in the ground" to be filthy and dangerous, very few voluntarily adopt any other. Even in places with available public sewer system its use, other than obligatory, is the exception.

The practice is in direct conflict with nature's method, is the surest way of poisoning the soil, water and surface air of inhabited places, and is the most apparent cause of habitual ill-health in centres of population.

Science discovers that the natural method is carried on upon the surface, or in the superficial layers of the soil where light, heat and other chemical and physical agents aid animal and vegetable organisms of the lowest type and minutest size, in the work.

Nowhere else are the ceaseless processes of destruction of dead and reconstruction of living organic matter of such vast proportions and marvelous efficiency, so well accomplished.

In this way nature is constantly bringing living things from the burial places of their predecessors, and in proportion to his imitation of the same methods does the successful farmer accomplish the same thing in the conversion of the so-called fertilizers, through properly tilled soil, into the stock and product of the grasses and grains.

The plan here proposed is simply a modification of these natural methods, to adapt them to easy domestic use for the return of dead and offensive matter in odorless and cleanly fashion to the ground.

The work must, however, begin by the cleaning out, disinfecting and filling with clean earth of all "holes in the ground" used for the reception or storage of excreta, garbage or slops, and the shallow burial of their contents in well-drained and cultivated land.

A similar method is the one to be used for all "dumping grounds" for the disposal of the organic refuse of towns, where such matters are to be deposited in shallow trenches, plowed under as

deposited, and the land so treated cultivated for crops.

For domestic purposes the following is the best procedure:

1. Dried (best sun-dried) humus, surface soil, garden mould, peat, clay (and other soils in proportion to the amount of these elements which they contain), coarsely pulverized by passing through an ordinary coal sieve, are, in order named, the best for the purpose. Used as here directed they destroy offensive odors and (with rare exceptions) convert excreta and other dead organic matters into combinations harmless to animals and exactly suited to nourish vegetable life.

2. To do this most thoroughly it is essential that the soil of the character specified should be dry and in coarse powder. The apparent and probably correct reason for this is that the free admission of air and the avoidance of a "water-logged" condition are essential to the life and activity of the microbes which are to do the work. They prevent putrefaction and malodorous decay.

3. No other fluids than those which accompany the natural discharges can be admitted to earth closets, for the reasons stated above, and all discharges are to be immediately covered with earth, so as to prevent any appearance of wet. Dampness is permissible, but not soaking wet.

The dry earth closet is not adapted to the disinfection and removal of chamber or kitchen slops, and should never be used for that purpose.

With the limitations suggested, dry earth, in quantity of at least a pint, before and after use, with intelligent and regular supervision, may be relied on for efficient service.

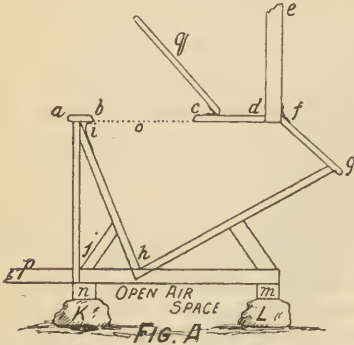
4. For the apparatus or closet the following are the essential conditions:

That it be non-absorbent of fluids or odors; that it be of such form as to be easily cleaned and constantly ventilated, and that the mechanism be of the simplest and least expensive construction consistent with efficiency.

All these demands are reasonably met by the plans herewith submitted:

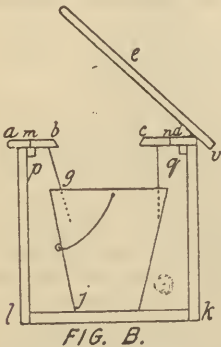
Fig. A represents a section of an out-house, in which the ordinary construction is changed to that of an inexpensive earth closet, costing less than a single cleaning of the old and filthy vault. It is, as the engraving shows, open to the air on all sides, and its walls should be low enough to permit

free ventilation between the seat and itself at the ends. Behind, it projects sufficiently to make the removal of its contents easy, but has a cover to keep



Section through out-door earth closet. a, b, c, d, seat, usual size; f, g, h, i, receptacle for excreta; h, under point little back of centre of hole, b, c; h, g, so inclined to give room between f and g, for removing earth and excreta; i, g, door swinging on hinges; f opening for cleaning, airing and sunning the box, g, h, i; j, zinc to direct urine into box; p, floor of house; e wall of house. Box, i, h, g, rests upon sills, m and n of house. Sills m and n should rest upon stones, k and l, and they on top of ground, leaving space for circulation of air. Box, i, h, g, to be made of plank and saturated with petroleum paint before use.

out the rain. The whole interior of the box (well made of seasoned wood) must be saturated with petroleum paint repeatedly till the surface is glossy. Then when thoroughly dry, it will resist all fluids and be easily cleaned as need be. For the dry earth, a box or barrel, with a pint zinc scoop for handling it, should be on the floor of the outhouse, handy and ready for use.



Section through centre of house closet. a, b, c, d, seat, distance, a, d, 13 in.; a, b, 4½; b, c, 10; b, c, the seat rests on cleats, p and q, and can be removed, joints at m and n.

To b, c, is attached a truncated cone, g, h, of zinc, 4 in. long, diam. 12 in., at top, 8 in., at o; g, j, is zinc pail, 13 x 13 in., with bail n; cover, v, e, turns on hinge d, and serves for back when raised. The box to be saturated with boiled linseed oil. The earth box of the same size and oiled. The earth scoop of zinc, capacity, 1 pint. Use coarsely powdered charcoal with the earth, if possible.

For household or sick room use No. 2 is all that is required, provided the following conditions are complied with:

1. That the fluid excreta be collected in an earthen vessel for other disposal, and not (except for young children) admitted to the closet.

2. That the earth be thoroughly dry, and in coarse powder. An admixture of coarsely powdered charcoal is a cheap, easy and very efficient addition, for either indoor or outside use. Use no odoriferous disinfectants in earth closets.

3. That the closet be under constant supervision, and that the first evidence of foul odor be immediately investigated.

The conditions seem, at first sight, onerous, but after all they are no more so than those which should govern the care of water closets and sinks. The household earth closet, conveniently placed in the woodshed, or other place outside the house, but not out of doors, will, especially in winter, be found a healthy substitute for the usual outhouse, and do away with the inclement journey, which is so common an excuse for the neglect, or postponement, of a necessary daily duty.

The winter use of the earth closet.—The earth to be used being dry does not freeze, so that it is as available and efficient as in summer, whether out or indoors.

The preparation of the dry earth.—A coal-ash sieve for sifting the earth before drying. The sifted material should be spread on a floor or rough platform, under shelter from rain but open to air. As fast as dried, store in barrels, in a dry place.

A half dozen barrels will serve a large family from October to May. It is easy and better to provide twice as much.

The disposition of the contents of the earth closets, if cared for as above directed, is very easy and inoffensive. Those in No. 1 can be quickly shoveled into a wheelbarrow and thence on the garden, spading it under the surface soil near growing things. As to the winter accumulation, it will, of course, remain in the outdoor closet till thawed out in the spring, when it is to be treated as above. Any accumulations in the house closets should be collected under cover outside the house, and treated as above in the spring.—O. N. H.

The Health of the Children in the Schools.

An appeal to School Teachers founded on Vital Statistics and Experience.

A LARGE edition of the first memorandum on this subject has been distributed and there is a call for another on the part of a few county and city superintendents, and individual teachers. Some of the Local Boards of Health are awakening to the advantage of the aid of Teachers in dealing with infectious disease.

It is a curious fact that there is no class more difficult to reach effectually for this purpose than teachers. It seems to be the common impression among those governing State and denominational schools that their co-operation is a purely voluntary one to be determined by their own ideas of its need. To such and to hesitating Local Boards of Health doubtful of their right to demand this co-operation, the following excerpts from Chapter 132, Laws 1883, are submitted.

"SEC. 23. That it shall be the duty of every person knowing of any person sick of any contagious disease dangerous to the public health—who he shall have reason to think requires the attention of the Local Board (of Health), to at once report the facts to the Board in regard to the disease, condition and dwelling place or position of such sick person.

SEC. 24. That no person shall within the limits of any town, city or village within this state, without a permit from the Local or State Board of Health, carry or remove from one (1) building to another, or from a vessel to the shore, or any railway cars, any person sick of any contagious disease, or the body of any person having died of contagious disease; nor shall any person, by any exposure of any individual sick of any contagious disease, or of the body of such person, or by any negligent act connected therewith, or in respect to the care and custody thereof, or by a needless exposure of himself, cause, or contribute to or promote the spread of disease from any such person or from any dead body,

SEC. 25. That every person being the parent or guardian, or having the care, custody or control, or any minor or other person, shall, to the extent of any means, power or authority of said parent, guardian or other person, that could properly be used or exerted for such purpose, cause and procure such minor or person under control to be so promptly, frequently and effectively vaccinated that such minor or individual should not take, or be liable to take the small pox.

SEC. 26. That no principal, superintendent or teacher of any school, and no parent, master or guardian of any child or minor, having the power and authority to prevent, shall permit any child or minor having scarlet fever, diphtheria, small-pox or any dangerous, infectious or contagious disease, or any child residing in any house in which any such disease exists, or has recently existed, to attend any public or private school, until the Board of Health of the town, village, borough or city shall have given its permission therefor; nor in any manner to be unnecessarily exposed, or to needlessly expose any other person to the taking or to the infection, or any contagious disease."

If anyone ask why should school boards and teachers be held to this accountability, the following statistics supply part of the answer:

TABLE SHOWING MORTALITY BY SPECIFIED CAUSES AT ALL AGES, AND AT THE SCHOOL GOING AGES.—AVERAGES OF FIVE YEARS, (1887-91).

ANNUAL AVERAGE OF 5 YEARS: Deaths from all causes, at ages, 14,408. Deaths from all causes between 5 and 20 years, 1,647--- 11.22 per cent.	Average Annual Mortality of all ages.	Average Annual Mortality 5 to 10 years	Average Annual Mortality 10 to 15 years.	Average Annual Mortality 15 to 20 years.	Average Annual Mortality 5 to 20 years.	Per Cent of Mortality at school-going age to total deaths from same cause at all ages.	Per Cent of Deaths from specified causes to total deaths from all causes between 5 and 20 years.
Tuberculosis.....	1,393	28	42	131	201	14.5	12.2
Diphtheria and Croup	1,041	321	112	39	472	45.3	28.6
Pneumonia.....	846	43	20	36	99	11.7	6.0
Typhoid fever.....	581	32	40	89	161	27.7	9.8
Bronchitis.....	339	9	2	4	15	4.4	.92
Scarlatina.....	210	53	11	5	69	32.8	4.2
Measles.....	170	16	8	10	34	20.0	2.07
Total.....	4,580	502	236	313	1,051	22.9	63.8

This table is founded upon a careful compilation of the returns of the last five years and relates to the diseases which have caused the greatest mortality at all ages, and more in detail, at the school-going age, the last divided into quinquennial periods. It brings out the fact that the danger of death by infectious disease as a whole, and by each leading affection of the class, is largely affected by the age of the victim, and therefore will be found to vary in schools of different grades, suggesting increased vigilance on the part of teachers. The first column of the table gives you an average of the eight diseases which cause the greatest mortality at all ages. In order of mortality—at all ages—tuberculosis leads and diphtheria is a close second, the others following in the order given, but between 5 and 20 years of age the mortality of diphtheria is double that of tuberculosis.

It is the mortality at the school-going age which concerns us now and the most striking fact brought out by the table is that the diphtheria; is six times as fatal as any other disease in the first class (children from 5 to 10 years of age); more than twice as fatal as any other in the second class (10 to 15 years); but not one-third as fatal as tuberculosis in the third class (15 to 20 years) and not half as fatal as enteric (typhoid) fever in the same class.

To state the facts in a professional way, teachers of primary schools should be on the look out for diphtheria, as 41.58% of all cases at all ages, occur between the ages of 5 and 10 years, while in the last class (15 to 20) but 3% of all deaths from this cause occur. These deaths at the school going ages together, are 45.3% of the total mortality of all ages from this cause.

Scarlet fever, though far behind, comes next in fatality among the first class, and pneumonia and bronchitis together cause the same mortality among them as scarlet fever.

It is worth your while to note too that the mortality from diphtheria at

the school-going age is 45.4% of the total mortality of that disease at all ages, enteric (typhoid) fever 27.7%, scarlet fever 32.8%, measles 20%, bronchitis and pneumonia 16.1%. Other facts of value will be found in the table but enough has been made to appear to prove the duty of the teacher in the attempt to diminish or prevent the spread of infectious disease.

But how? In this way: Apply to your Local Board of Health, or directly to the Secretary of the State Board at Red Wing for copies of the Memoranda upon Diphtheria, Enteric (Typhoid) Fever, Scarletina, Measles, and the disposal of excreta, and read them all, but particularly the one which discusses the disease which happens to be prevailing, if any. They will be found to contain about all the information you need; should anything be lacking write directly to the Secretary, as above, who will give you a prompt reply. You will find that for prevention it is convenient to study diphtheria, scarlet fever, and measles together because they agree in being infectious in the secretions of the nose and mouth, and all but diphtheria in the eruption of the skin.

Inquire frequently of the Local Board of Health, and ask its executive officer to keep you informed of the presence of infectious disease. In country districts and small towns it sometimes happens that you will learn of sickness in the families of your children before the Local Board; in such cases give the Health Officer or the party acting as such, the name, residence and reported disease, that he may investigate. Should there be any difficulty in finding the proper officer or any lack of attention to reasonable requests, apply directly to the Secretary at Red Wing who will put you on the way to hearty co-operation. *In writing to him always give the name of village, city or township, and specify just what you want.* In the great majority of cases you will find every disposition on the part of your Local Board to help you, and thanks for your assistance.

But it is not in emergency that your most effectual work can be done for your pupils and your own good health, it is rather in the every day routine of the school life that your service as the Health Officer of a school is most useful. If you will come to understand this and its importance you will never pass an hour in school without a benificent use of your art. Children more than adults need abundant and fresh air. I use the word "fresh" advisedly because air may be chemically pure and yet be unfit to breathe. It is you know a mechanical mixture of gases of which all are essential and the mixture is one made "in the open," a natural result of an infinite variety of forces under the supreme law whose work we do not fully understand. To get an idea of the difference between natural and artificial air, imagine one made in the laboratory by the most skilful chemist and compare it with that which comes "from out of doors," they might correspond chemically but physically, and in that chemistry which stands close to the processes we call life they would differ so widely that practical use for breathing would condemn the one and instinctively demand and use the other. Now, in houses, we are utterly unable to secure the quantity or quality of fresh air supplied in the open, the difference is not only great but essential, and never to be lost sight of. "Perfect ventilation by artificial means" is impossible and tolerable ventilation is the best you can expect with your utmost care in the school house. Another fact, the suspended matter in the air has much to do with its healthfulness, more than is suspected. Remember that the specific poisons of

diphtheria, scarlet-fever, whooping-cough, measles, small-pox, typhus and other infectious diseases are breathed floating in the air, the most common method of their distribution. There are other matters, causes of danger to health which reach us in the same way.

Consider, for a moment, what they are. Many of the "odors" of the schoolroom are not removable by such ventilation as you can secure, or the "ventilating engineer" supply. For present purpose it will be sufficient to divide these "smells," called together "foul air," into three classes: 1st—Those in breath from lungs and air passages of teachers and scholars; 2d—Those from their bodies and underclothing; 3d—Those from their outer clothing which includes that of head, body and feet.

I venture nothing in stating that, in general, the first, so far as aerial danger is concerned, is the least dangerous of all; that the second is the most dangerous, and the third, as a rule, less than the first. It is well to be reminded that it is not the "odor" but the "dying" or "special" character of the organic matter contributed as above which is dangerous when "suspended" in the air of respiration. Its *special* character, if it have any, is due to the special virus of some communicable disease. "Dying" organic matter in suspension in air, and from living bodies, when in constant excess was called by the old doctors, "civic miasm," and had much to do with the origin and spread of "jail" or typhus fever so fatal in Howard's time. Now, in smaller amounts in the air of inhabited places, its influence is to clog physical activity, dampen mental vigor, and predispose to the attacks of disease. This is not the place for details which the iterated and reiterated experience of every faithful teacher will supply.

To control these dangers, begin with teacher and scholars before they enter the school-room, and provide that they shall come there always reasonably clean in person and clothing, for so far as they are concerned this is a sine qua non if the ventilating powers of any available air space are not to be tested beyond capacity.

Next provide that the school-room be itself clean, have sufficient air space, proper arrangements to change the air, proper lighting and heating, with suitable furniture. Add to these, limited occupancy, pure water supply, with suitable outhouses, and you have the material which a competent teacher may use to very great advantage in securing a reasonable air supply for himself and his pupils.

Taking the one-room village, and country, school-house for illustration—the school-room for 30 scholars (all that one teacher should be required to instruct) should be 45x30x12 feet. This gives 45 square feet of floor space to each child with 540 cubic feet of air space. Windows should have together about 250 sup. feet in area, and if not possible on both sides, then on the left. The floors should be of sound and well-seasoned wood, smooth and well made, and thoroughly saturated with hot, boiled linseed oil. The same rule for the wainscot. The walls should be of hard finish and kept sweet and clean by quick-lime wash, as often as every term. Furniture to be movable, and when of wood, treated as the floor. Windows to have movable sash, and interior sectional blinds of wood or linen on frames, which last should be made like mosquito bars and in three sections. There should be ample arrangement for cleaning and storing foot-gear outside the school-room, and outer clothing should be provided for in cloak rooms.

The regulation of ventilation in winter, late fall, and spring, is the real problem in our climate; the summer should offer no difficulty. Warming is best done by the hooded stove with available outside air-supply, and ventilation by the raised lower sash, a common and good method if properly used. Relying upon any apparatus and oversight of that alone for pure air supply will meet but moderate success under the best conditions, if the school-board or teacher neglect the facts as to disease prevalence here stated, or omit to insist upon the observance of cleanliness of person, clothing, school-room, and furniture, with their respectful use, that should be demanded in the interest of pupil, and public alike, for the common good.

C. N. H.

UNIVERSITY OF MINNESOTA.

DEPARTMENT OF SANITARY SCIENCE (PUBLIC HEALTH.)

PLAN OF INSTRUCTION FOR TEACHERS ATTENDING THE SUMMER SCHOOL, SESSION OF 1894.

CONDITIONS.

That the student be a teacher for the coming year; that he will use the information given in the everyday conduct of his school; that he attend the lectures of the course regularly; that he devote at least five hours to laboratory work in air and water analysis, and that he submit at the end of the course to a written examination to test his knowledge of the subjects taught.

ABSTRACT OF THE COURSE.

Four Lectures—Time, 4:30 P. M. on Fridays; place, lecture room and laboratory of the Department of Public Health, Mechanic Arts building.

1. Methods of air and water analysis available for the teacher—requiring only the knowledge every teacher is reasonably assumed to have, and such apparatus and chemicals as are easily procured with the least trouble or expense. These are sufficient to determine whether a sample of air or water is reasonably pure, in a sanitary sense, or should have further examination. In the last case the Local and State Boards of Health will immediately assist, if called upon.

2. The common and preventable causes of ill health and sickness to which teachers and pupils in the public schools are exposed. Microscopic or magic lantern demonstrations, charts, diagrams, etc.

3. The construction and furnishing of school buildings for health, cleanliness, light, heat, ventilation and furniture.

4. Working details of teachers' duty in forefending or controlling the causes of ill health or sickness; the use of Boards of Health and how to teach Hygiene in the school.

LABORATORY WORK.

Construction and arrangement of apparatus, the preparation of chemicals and their use. Testing of samples of air and water. At least five hours should be devoted to this work. More time can be arranged for if desired.

EXAMINATION FOR CERTIFICATE.

Written examination, and two hours allowed, if need be, to complete it. Further details will be given at the lectures, or on inquiry at the laboratory.

CHARLES N. HEWITT,
Professor.

PUBLIC HEALTH.

(In the Schools.)

What Teachers of All Grades Should Know of It, and How to Use It for the Instruction and Benefit of Their Pupils and Themselves.

This memorandum (a revision of one written for and distributed to school teachers in 1885) is based on the assumption that they recognize the need for better instruction in public health than they now have, to enable them to care more efficiently for themselves and their scholars by securing health and preventing disability and sickness.

The population of the school-going age (5-20 years) belongs to the class most susceptible to the influences of the causes of ill-health and specific disease. This period is in a physical sense the formative period of life, as it is in all other senses, but is peculiarly so as respects the influences which favor health or disease. 11.11 per cent of all deaths are of persons of the school-going age,

Fifteen per cent of all deaths at this age are from tuberculosis, 44 per cent of the dead from diphtheria, 33.5 per cent of the dead of scarlatina, 28 per cent of the dead of enteric (typhoid) fever, 20 per cent of the dead of measles, 15.5 per cent of the deaths from pneumonia and bronchitis, 7.6 per cent from diseases of the nervous system, 10.19 per cent of heart and blood vessels, 15.39 per cent of the digestive organs. These deaths (an average of 1619 per annum) represent more than five times as many cases of specific disease, and for every death you may estimate two constantly sick. Teachers ought to be able to estimate the disability from causes short of actual sickness—feverishness, headache, eyache, and other disabilities hard to define but real, incapacitating from study or at-

tention. They are important in another respect, as they usually indicate danger from actual disease and point to the cause. This will appear clearly as we get on.

As applied to our subject, I take it that practical hygiene is that which is available for every-day use, and its value is greatly increased for that reason—that its teachings are available in the daily conduct of your own lives. As now taught, there is more of theory than fact, for the theory is more easy to teach than its every-day use. It is apparently more complete and systematic, and so as a something to be taught is more acceptable to the average teacher than its actual practice.

There is so much misunderstanding as to what are the basis facts of public health that a brief statement for teachers' use will help to explain and justify the little plan I have to propose.

First—Health, though the normal state of men is rarely attained.

Second—Ill-health, specific disease and premature death are the rule rather than the exception in most lives, they are the penalties paid for the violation of natural laws, which, as they relate to health, are sanitary laws.

Third—Obedience to many of the most important of these laws is instinctive, a knowledge of others is possible for the majority of civilized people and therefore their violation is inexcusable in proportion to civilization.

Fourth—The natural life is the ideal one, and the nearest approach to it possible for the greatest numbers is the leading motive of public health. It is evident, too, that such a life is made possible just in proportion as it can be lived in obedience to natural laws.

Fifth — The chief obstacles thereto are (outside personal ones)

the frequent powerlessness of the individual against inheritance of ill-health, or the unhealthy life and example of other persons. The elementary conditions of approximate healthy living are the possession and proper use of (A), abundant pure air; (B), abundant pure water; (C), abundant unobstructed light; (D), enough and properly prepared food; (E), proper and sufficient clothing which includes shelter and bed; (F), opportunity for the natural development of the whole man, to maturity under the above conditions—true common education; (G), opportunity for self-sustaining work, for play, for rest, for sleep. The individual alone is not sufficient for these essentials; they are, except the first three, under any circumstances, the result of associated living in home, community, state, nations, with other people immediately, and involve also relations with other living things and what we call nature. Their use is a means of education and a source of knowledge. Healthfulness is in our civilization the outcome of the performance of duty in all these relations.

Hence the familiar and natural subdivision of hygiene into personal, family, municipal, state, national and international.

The unit of hygiene for the family is the individual, for the municipality and the state, the family. These units are inseparable in community life, and hygiene for the family and the individual must be learned and taught together, as the hygiene of the home, the origin and centre of healthy life.

I think it is essential that in the study of the causes of health and ill-health we begin with our relations to the elements of all created things, the air, water, sunlight, soil. Next come plants and animals below man, then man.

As the average of health is below what is conceded to be a natural and attainable standard, and the average mortality is far higher than we know it ought to be, it needs little argument to persuade intelligent people that these losses should be prevented or diminished, but I find it takes a good deal to persuade them that they need anything else but legislation, or that they have any personal work to do for others and often for themselves.

The object of instruction in public health is to prove the duty of the individual in every relation, to make this art an every-day helper, and to show him how to do it.

Fortunately many of the helps to good health are apparent, and so are some of the causes of ill-health, or within easy reach. It is not necessary, for the instruction here proposed to go beyond the concrete and demonstrable fact, so that within the easy comprehension of an intelligent child most of the basis truths of personal and family hygiene can be clearly and impressively taught, so as to become springs of intelligent action for school children, beginning the simplest demonstrations and experiences with the youngest, and going on with the older scholars to the principles which are to guide them, in the matter of maintaining health and warding off ill-health to their life's end.

The personal advantage of such instruction is almost equaled by the good to the public. Only those who have to contend daily with ignorance and prejudice in matters of public health when enforcing the law, can properly appreciate what a gain such knowledge would be to well-being and well-doing. The foundation of the plan here proposed is the instruction of teachers in public health, both as a science and an art, to enable them to work out for the

instruction and benefit of their pupils, with the means any school can furnish, demonstration of such facts as the following:

First — Air, its composition, uses, difference between that of "the open" and the house, inspired and expired air, matters in suspension or mixture in air, how it becomes injurious to health, and the detection of defects in its composition and impurities it may contain.

Second — Water, rain, pond, lake, river, well and cistern. Simple physical and chemical characteristics, its uses, how it may be a carrier of disease. How to detect impurities and disease germs in water. How to tell good from bad.

Third—Light, its physics and chemistry as respects health and disease.

Fourth—Foods, inorganic, vegetable, animal, their uses, modes of preparation, adulterations, simple tests for.

Fifth—Clothing, meaning of the term, uses of, varieties of, as carrier of disease, how to judge clothing.

Sixth—Work and play, their varieties and relations to health.

Seventh—Rest and sleep, need and times for, difference between, definitions of.

Eighth—Personal hygiene, how to use this knowledge for the preservation of health and the prevention of disease.

Ninth—Disease. What is it? infectious and non-infectious, ill-health, short of well-defined sickness; accidents, vaccine and vaccination, reason for; prospect of other similar methods of preventing disease. Isolation of the sick of infectious diseases, and of persons exposed, disinfection of persons and clothing, rooms and houses.

Tenth—Death, and natural disposal of dead, vegetable or animal, organic matter, nature's method of earth burial, explana-

tion of, as applied to disposal of human excreta and refuse. Artificial methods; importance of, as affecting purity of soil, air and water.

This little syllabus you will find a pretty full one, and sufficient to test the knowledge of the best teacher, yet it is barely what educated people ought to know, and will lead to much more information if faithfully used. It involves study and search for evidence, available as illustration, in the daily events of the school room and life, odors, water supply and use, heating or cooling, ventilation, lighting, cleanliness of persons and things, sickness or accident, which may serve to suggest a lesson and fix a truth in the surest way.

Instruction by a well-prepared teacher comes in this way without text book, or apparent intention to teach, or special hour, but by availing himself of the abundant opportunities to teach individuals even more than the school how to escape many a pain or ache, and the loss of a lesson, a pleasure or a holiday.

Beyond this gain, great as it ought to be, see what would be the outcome of such work by increasing numbers of earnest and interested teachers, hearty co-workers in public health, informing themselves as much as their pupils, and so doing efficient sanitary work in thousands of homes. And when an outbreak of serious disease comes, as it does to many communities, the Health Officer finds intelligent co-operation from teachers and the families they have taught through their children. Confidence and courage replace ignorance and cowardice, and the chances of his success are increased and their safety promoted by the substitution of definite knowledge as here proposed for current popular belief on the subject.

INFECTIOUS DISEASES.

THE PERIOD OF INCUBATION OF INFECTIOUS DISEASES (the time between receipt of the infection and the appearance of the disease) **AND THE DURATION OF THE INFECTION.**

This is not a settled matter but one which must be determined by the largest average of skilled observation. The following table has been revised to date and does not differ materially from the last one. It is published as one of the regular "file" sent out upon notification of infectious diseases, and in such form as to be available for those Health Officers who wish a "mem" for ready reference. Any careful observations upon the time of incubation or persistence of infection will be acceptable.

Note.—This circular should be distributed to medical men and heads of families.

Mothers can reduce the period of "isolation" to the minimum limit, very often, and always increase the comfort and chance of recovery for the sick, by cleanliness, with constant disinfection of persons and things as directed in the circulars on most of these diseases to be obtained of any Board of Health.

The Local Board of Health is the judge as to the time and character of isolation of the victims of these diseases.

Name of Disease.	Period of Incubation.	Eruption appears.	Duration of Infection.
SMALL-POX	12 to 14 days (Av. 12 days)	2d or 3d day on face and forehead	4 to 8 weeks or till all "scabs" have come off,
CHICKEN-POX	7 to 14 days (Av. 12 days)	1st to 4th day trunk and shoulders	3 to 4 weeks or till all scabs have fallen off
MEASLES	10 to 14 days (Av. 12 days)	On forehead on 4th day of fever	From 3 days before eruption till scurfiness is gone. 2 to 4 weeks.
ROTHELN	7 to 15 days (Av. 14 days)	On face 1st to 4th day	Same as measles.
SCARLATINA	1 to 7 days. (Av. 3 to 4 days)	On trunk 2d day of fever	Till all scurfiness is gone and throat well. 5 to 8 weeks
DIPHTHERIA AND MEMBRANOUS CROUP	2 to 10 days (Av. 2 to 5 days)	No eruption	From beginning of disease till <i>three weeks after throat is well.</i>
WHOOPING-COUGH	2 to 10 days (Av. 7 days)	No eruption	Three days before eruption and till "whoop" is gone. Av. 6 weeks.
MUMPS	15th day	No eruption.	24 hours before the peculiar swelling and for a month.
ENTERIC (TYPHOID) FEVER	1 to 23 days (Av. 12 days)	If any, spots on abdomen 5th to 8th day of fever.	From beginning of disease till fever disappears and diarrhoea stops. Av. 8 weeks.
TYPHUS FEVER	1 to 23 days	On back and sides 5th to 8th day of fever.	From beginning of disease and while fever lasts.
ERYSIPELAS	4 to 7 days (Av. 4th day)		From beginning of redness till skin is clear and well. 3 to 4 weeks.

UNIVERSITY OF MINNESOTA.

DEPARTMENT OF PUBLIC HEALTH.

MINNEAPOLIS, January 22, 1895.

To the Medical Profession of Minnesota:

The chemical and bacteriological laboratories of the State Board of Health, which I have organized by permission of the Board, are now located here.

I offer assistance in the diagnosis of the following-named diseases of men and animals:

OF MEN.

1. *Diphtheria.*

Boxes containing a test tube of sterile blood serum, and in another test tube a probang, will be mailed to any physician sending address by letter or telegram who will comply with the conditions accompanying the package. Usually within twelve hours after return of the tubes to the Laboratory, the result of bacteriological examination will be telegraphed or written, as desired, and another box will be sent, if requested, at the termination of a case, to decide positively the fact of the presence or absence of the bacillus of Loeffler's and associated bacteria—on the same conditions as the first box. The importance of these two tests is self-evident.

To save time, a piece of the membrane of a suspected case, or a smear from the throat upon a bit of sterilized cotton inclosed in a half-dram bottle (bottle and cork first sterilized by boiling water), may be sent with the request for the first box, and result of examination will be telegraphed or written, as above.

2. *Tuberculosis.*

Sputa,—preferably that, of the morning,—pieces of material, or discharges from suspected wounds, may be sent in dram vial (bottle and cork sterilized as above), with description of case for our records, to the Laboratory. As a rule the result of examination will be telegraphed or mailed, as requested, on the day of receipt.

3. *Vaccine*

From the calf may now be obtained from the Minnesota Vaccine Station at Red Wing. For details, see attached circular.

OF DOMESTIC ANIMALS.

The profession can do much to assist in the discovery and extermination of Tuberculosis and Actinomycosis of cattle, Trichinosis in swine, and of Glanders in horses, if they will assist the State and Local Boards of Health in the following among other ways:

4. *Tuberculin and Mallein*

For the diagnosis of Tuberculosis of cattle, and Glanders in horses, will be sent free of charge to physicians who will use them as directed and report results upon the forms furnished, in coöperation with the Local Boards of Health, who are by law responsible for the care of these diseases.

5. *Trichinosis of Swine.*

This disease is more common than is suspected. The muscle of the diaphragm is most likely to contain the worm. Sections of muscle the size of the little finger, in clean and well-corked vial, if mailed with description to the Laboratory, will be examined and results reported immediately.

Brief histories of the case should accompany each specimen, with diagnosis and clinical reasons therefor, for the records of the Laboratory. The utmost care should be taken in the collection and preparation of material to prevent access of foreign germs.

All requests by mail should include addressed and stamped envelope for reply. If a microscopic slide is desired, inclose twenty-five cents in stamps with the request.

6. *Sanitary Analysis of Water suspected of Organic Impurity.*

Describe the suspected supply and write for blank before sending sample.

ANTITOXINE OF DIPHTHERIA.

I do not supply it. Steps for its production have already begun at the Vaccine Station, upon the success of which will depend our ability to furnish it for the use of the profession, should a larger experience support the claims it now makes as a remedy in Diphtheria. In the meantime, numerous inquiries as to the reliability of the various brands now upon the market lead me to suggest that only products of recognized reputation should be used. At present they are chiefly of European production; in Germany, Behring's and Aronson's; in France, the Pasteur Institute, Paris, and there are others of which I am not certain.

In America, the State Board of Massachusetts, the City Board of Health of New York and the Marine Hospital Service have begun its preparation. Some private and business establishments also intend to supply it, and more will doubtless follow. There are one or two American preparations on the market about which I do not yet know enough to express an opinion. I am making arrangements at the Laboratory to test the antitoxic value of any samples submitted by medical men for that purpose, if it would be helpful to do so; but as they usually get it in small quantities and for urgent and immediate use, this test is not likely to be much called for, as it involves time (some days).

CHARLES N. HEWITT, M. D.

Address for these purposes:

DEPARTMENT OF PUBLIC HEALTH,
University of Minnesota,
Minneapolis.

REPORT OF INFECTIOUS DISEASE

To be made, within twenty-four hours, to the Local Board of Health of the Town, Village, or City in which the sick person is.

Sec. 20. That every physician shall report to the Local Board of Health, in writing, every person having a contagious disease, and the state of his or her disease, and his or her place of dwelling, and name if known, which such physician has prescribed for or attended for the first time since having a contagious disease, or since the discovery of the same to be contagious, during any part of the preceding twenty-four (24) hours; but not more than two (2) reports shall be required in one (1) week concerning the same person; but every attending physician thereat must see that such report is or has been made by some attending physician.

Sec. 21. That it shall be the duty of each and every practicing physician in this State to report in writing to the Local Board of Health the death of any of his patients who shall have died of contagious or infectious disease, within twenty-four (24) hours thereafter, and to state in such report the [specific] name and type of such disease.

Sec. 22. That every keeper of any private house, boarding-house or lodging-house, and every innkeeper and hotel keeper shall within twenty-four (24) hours, report in writing to the Local Board of Health the same particulars required of any physician in the preceding section, concerning any person being at any of the aforesaid houses and hotels, and attacked with any contagious disease dangerous to the public health.

Sec. 23. That it shall be the duty of every person knowing of any person sick of any contagious disease dangerous to the public health, and the duty of every physician hearing of any such sick person, who he shall have reason to think requires the attention of the Local Board, to at once report the facts to the Board in regard to the disease, condition and dwelling place or position of such sick person. [Of Chapter 132, Laws of 1883. Sec. 30 defines the penalty.]

Copies of law, and instructions for management of infectious diseases can be obtained on application, from your Local Board of Health, or from DR. HEWITT, Red Wing, Minn.

Dated 189

P. O. Address

Date

Location and address of head of infected family

The disease is

Names of Patients
[Christian]

Sex
[M or F]

Age

Date of
Attack

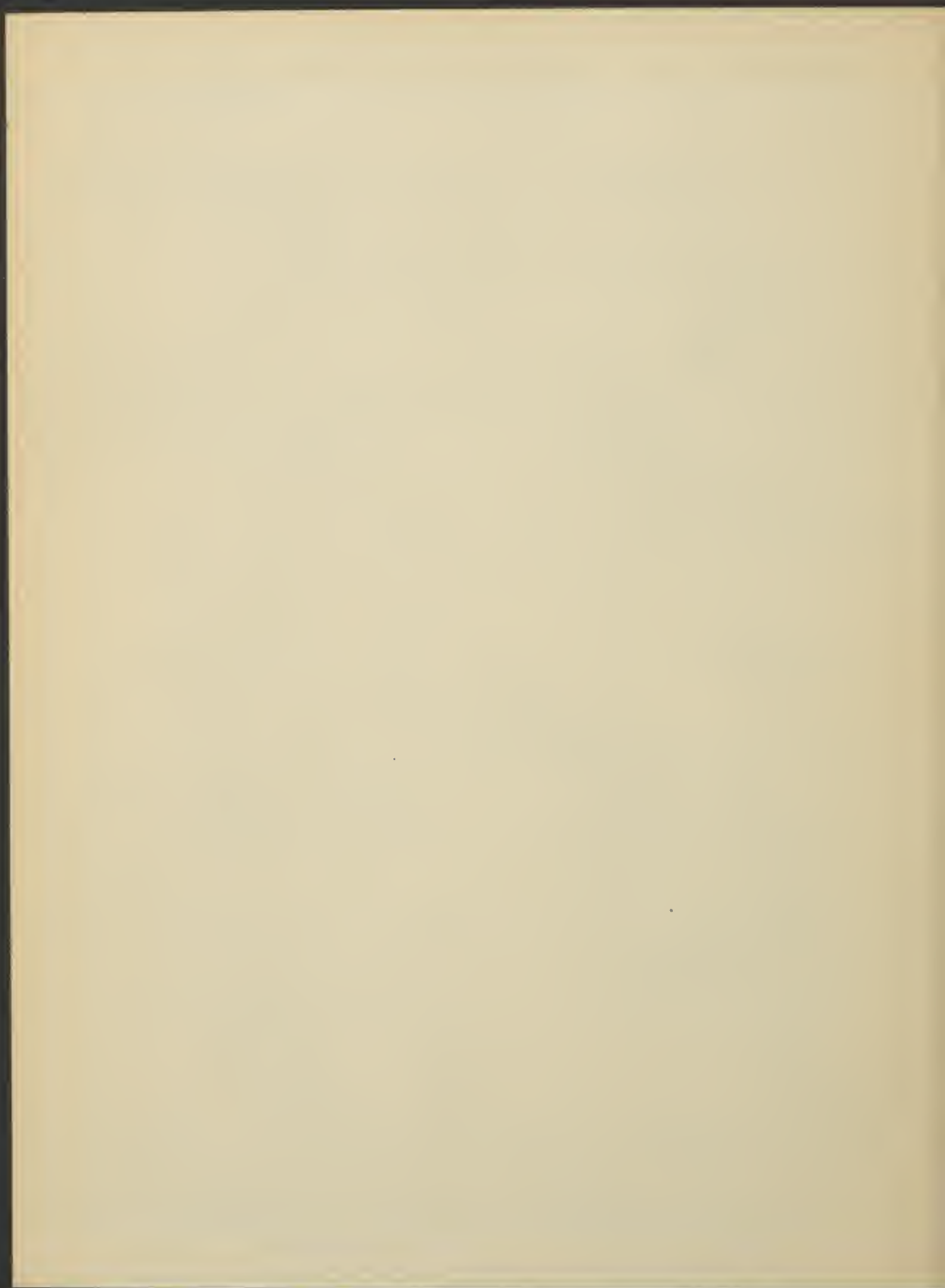
No. in family Males Ages Females Ages

Name and address of other families exposed

Name and address of attending physician

Name and address of person making this return

And any other information as to the origin of the disease.



"The town supervisors of each town together with a physician, to be employed by said supervisors when in their judgment necessary, or when ordered by the State Board of Health, shall constitute a Board of Health, and all villages, boroughs and cities shall have a Board of Health, to be chosen and to consist of the number hereafter provided, anything in the charter of any such village, borough or city to the contrary notwithstanding; such Boards shall, within their respective towns, villages, boroughs and cities, have and exercise all the powers necessary for preservation of the public health. (Sec. 1, Chap. 4, laws of 1885, amending Sec. 4, Chap. 135, laws of 1883.)

[It] shall be the duty of all local Boards of Health, whenever they are informed that there is a case of small pox, scarlet fever, diphtheria or other infectious or contagious disease within the territory over which it has jurisdiction, to immediately examine into the facts of the case, and if the disease appears to be of the character above specified, they shall adopt such quarantine and sanitary measures as may in their judgment tend to prevent the spread of said disease in its locality, subject to be modified by the State Board of Health, and shall immediately notify the secretary of said State Board, of the appearance of such disease and the measures adopted by said local Board in relation thereto." (Sec. 18, Chap. 132, laws of 1883.)

MINNESOTA STATE BOARD OF HEALTH AND VITAL STATISTICS.
OFFICE OF SECRETARY AND EXECUTIVE OFFICER.

Red Wing,.....189

Dear Sir: It is reported to me that

Your attention is called to the above extracts from the law as to the control of infectious diseases of men, and you are requested to make an immediate investigation, and report, as there required, stating, in detail, the action taken. Report your subsequent action till the matter is disposed of, and return this sheet entire. Yours respectfully,

CHARLES N. HEWITT, M. D.
Secretary and Executive Officer.

In reply to the above I have to report the facts and the official action of this Board in the above matter as follows:

Use other side of sheet if necessary.

Chairman or Health Officer.

Dated

189 . P. O.

MEASLES.

(RUBEOLA.)

PARENTS, and particularly mothers, are requested to read this little paper carefully to learn how they may save their own and other children from needless sickness, possibly deformity and death, by co-operation with the Local Board of Health in the control of Measles, as of other infectious disease.

What is it? It is one of the eruptive fevers usually recognized by its peculiar "catarrhal" symptoms and characteristic "rash." It has been confounded with the first stages of small pox and scarlet fever but this may be avoided by isolating the patient for two or three days, when the fact will be apparent.

Its specific poison or infection is produced in the rash, which contrary to common opinion, invades the membranes of the nose, throat, lungs and bowels before, and often more severely, than the skin. It escapes first in their secretions, and afterwards from the eruption on the skin. The first is the most virulent and abundant, and most difficult to control; the last is the least virulent and most readily destroyed.

But is it worth while to attempt to restrict or control measles? Most people and many physicians, advise "that children be permitted to catch the disease and be through with it, as the risk is slight and the mortality trifling." The time has passed to advocate the "catching" of any disease and as to the danger and mortality of measles let the following facts drawn from our records of the last five years answer. Total deaths from measles in that time in Minnesota, 850, an annual average of 171. 1.2% of total deaths from all causes, or 131 deaths to 1,000,000 living.

In the mortality of the last five years 74.12% were children under 5 years of age, and more than half (52.35%) under 2 years of age. Neither diphtheria or scarlet fever cause so great proportionate mortality under 2 and 5 years of age, as does measles.

Seasonal mortality, 45.29% occurred in spring; 25.46% in summer; 20.59% in winter, and 7.64% in autumn.

It is a great mistake to say that the mortality after Measles is due rather to complications than to the disease itself. The most common are affections of the lungs and bowels, and are but exaggerations of the usual conditions of the disease, the severity of the attack being expended on the mucous membranes instead of on the skin. In the great majority of cases the disease is sufficient to account for the death, without calling any other cause. As to the "sequelæ," as they are called, those affections which so often follow directly in the wake of measles: sore throat, nose, eyes and ears, scrofula, dropsy and other affections, there is no dispute as to their frequency, severity and importance. Now comes another objection. "But it is easier borne in infancy and childhood than by older people and it cannot be prevented anyway." To that the reply is this: The mortality and disability following the disease justify an effort which has repeatedly, and recently, been very successful. In England, where the mortality is greater than from either scarlatina or diphtheria, obligatory notification and isolation, have worked very important reductions in both sickness and death rate where enforced. So they have in our own State. It is our duty to make the attempt more general.

What to do to prevent or restrict measles. Mothers can do more than any one else because they see the first symptoms and can isolate a child promptly who is suspected of the disease. It is often a question to mother and physician whether a rash is that of scarlatina, measles, or some less important skin affection. The safety of the child, in any event, is best assured, by sending it to bed, or by a few days isolation. A day or two of quiet, and a hot bath will settle the question, and if either of the diseases is found, early care promotes the safety and recovery of the sick, and at the same time the safety of other children in the family, the neighborhood, and particularly in the school, which the children of the family attend. This education of mothers is the first and most important duty of the Local Boards of Health as respects the management of all infectious disease.

Next in importance is the co-operation of the school teachers, whom supply with this and all other circulars. When measles, or other infectious disease appears, notify them immediately of their duty to co-operate (see Chap. 132, Laws of 1883)* and give the name and address of affected families, with request to exclude all children from such families or who visit them. Teachers should notify the Local Board of Health of children sent home from school who are too unwell to study, and should not permit a child with fever, hoarse or croupy cough, or well marked eruption on skin, to remain at school without the permission of the Board of Health.

Houses in which are the sick of measles or other infectious disease, should be placarded, the children restricted to the home, and no visiting permitted. The men of the family doing outside work, and not attending the sick, may go to work as the danger from clothing infected with this disease is not great in the open, away from children. New cases in the family of the first case will develop, if at all, by the tenth or twelfth day. If they do not, hot baths for all, with boiling water for infected clothing and bedding, and a thorough scrubbing of room and furniture will clear the record and remove occasion for further isolation. Patients to be isolated till "rash," "scurf" and "cough" have disappeared—from fourteen to twenty-eight days.

Care of the sick of measles. Put in a quiet clean, well ventilated and isolated room with the least furniture, carpets, etc., consistent with comfort. The nurse should wear an apron large enough to cover from neck to wrists and feet, while on duty and take other reasonable precautions. The well children should be kept as far from the sick as possible, in another building, if practicable.

Thorough anointing all over with simple ointment (one part mutton tallow or white wax, and two parts fresh lard melted separately and stirred till cold) will do much to keep the virus of the rash, on the skin or in the underclothing. All discharges from mouth, nose, or eyes, should be collected on rags and burned, or on handkerchiefs or towels and immediately put in hot water and boiled. Discharges from the bowels should be into a vessel containing a cupful of fresh lime water.†

These attentions and precautions, easy to take and simple to use, will reduce the chances of the spread of measles from a given case, or family, to small proportions, particularly among the very young where it finds the most of its victims. In no one of the infectious diseases is the co-operation of mothers more important, and in none will it be so promptly given when they come to know the truth of the matter as here stated.

C. N. H.

* SEC. 26. That no principal, superintendent or teacher of any school, and no parent, master, or guardian of any child or minor, having the power and authority to prevent, shall permit any child or minor having scarlet fever, diphtheria, small pox or any dangerous, infectious or contagious disease, or any child residing in any house in which any such disease exists, or has recently existed, to attend any public or private school until the Board of Health of the town, village, borough, or city, shall have given its permission therefor; nor in any manner to be unnecessarily exposed, or to needlessly expose any other person to the taking or to the infection of any contagious disease.

† LIME WATER is the clear solution of quick-lime. Take best quick-lime in lumps, put in a pail, pour on one-third as much of water, cover closely and slack till it is a fine powder or creamy fluid; one part of this to three of water will make a saturated solution. Add water in that proportion to the mixture, stir well and then pour on half a tea cup of kerosene, which will protect it from the air and preserve its strength. Use the solution as needed, and the solid matter, mixed with more water, can be used for whitewash or thrown into the sewer or out-house.

DIPHTHERIA—WHAT IS IT, ITS MORTALITY, ITS CAUSES, AND ITS PREVENTION IN MINNESOTA.

DIPHTHERIA is a very infectious disease, and has the dreadful peculiarity that it may attack the same person twice. Its infection attaches itself to clothing, bedding and the like, where, if not exposed to direct sunlight or moisture, it retains its virulence for months. It seems almost to grow in old and damp houses, and is, in every place where it cannot be directly dealt with, exceedingly tenacious and persistent.

The germ of the disease is a microscopic, single celled plant having the form of a little rod, whence its Latin name "bacillus diphtheriæ." These little cells do not, so far as is now known, penetrate the vessels of the human body, or the fluids or tissues. Their favorite location is the mucous membranes of the mouth, throat, and air passages. There they lodge, and multiply enormously and rapidly. During this growth the peculiar virus of the disease is produced. This virus is a snbtle poison, resembling the venom of snakes in some of its effects; it is ab-orbed into the circulation with varying rapidity, not always in proportion to the amount of the peculiar exudation, or membrane which resembles a piece of wash leather, or an old-fashioned wafter, white, but with different shades of white. In the depths of this membrane the bacilli produce the poison. Like snake venom it may be swallowed, with impunity by men and animals, and in large amounts, under whose skin an exceedingly minute amount would be fatal.

Croup.—Sometimes this membrane begins in the wind-pipe, mechanically producing the obstruction to breathing, and the peculiar cough which we call "croup". This happens so often and is so frequently assumed to be some other affection than diphtheria, (thereby opening the way for the unchecked virus to do its deadly work) that experience has taught us to *treat all cases of croup as diphtheria*, and that should be the rule of all Boards of Health.

It was the fearful mortality of this disease in 1882 which helped more than any other one fact to get the great charter of our sanitary rights (Chapter 132, Laws of 1883) on the statute book of the State. Under that law the present large and efficient organization of the State Public Health Service (the State Board of Health and over 1,600 Local Boards) has grown into a compact and efficient body.

No better proof of its executive ability could be given than the evidence of the following statistics. They give the mortality from diphtheria since 1881, with the population of the census years:

Years	1882, (pop. '80, 780,773)	1883,	1884,	1885,	1886,	1887,	1888,
Deaths	1602,	1374,	1211,	1138,	....	768,	860,
Years	1889, (pop. '90, 1,301,826)	1891,	1892,	Average of last 6 years.			
Deaths	889,	772,	720,	650,	781.		

Seasonal prevalence, (average 6 years).

Spring	20.6 per cent.	Summer	17.5 per cent.
Fall	30.0 per cent.	Winter	30.3 per cent.
Maximum mortality, October	12.5 per cent.	Minimum mortality, July	5.2 per cent.
State	5.9 to 10,000 living	Cities of 15,000 to 30,000	4.2 to 10,000 living
Cities of over 100,000	7.4 to 10,000 living	Cities of 5,000 to 15,000	6.3 to 10,000 living
Villages and townships under 5,000	5.5 to 10,000 living.		

Relative diphtheria mortality in centres of population over and under 5,000, (average of 6 years): 400,839 live in centres of over 5,000, 287 deaths (of total 1,651), 34 per cent of all deaths by diphtheria, and at rate of 7.4 to 10,000 living. 900,987 live in centres of less than 5,000, with 503 deaths, 66 per cent of total, at the rate of 5.5 in 10,000 living.

Croup must still be recognized as a distinct disease, but to correct a false impression it is joined with diphtheria in the following statistics from the returns of 1892:

In the State, diphtheria and croup together caused	6.7 deaths to 10,000 living
In two cities of over 100,000 population each	8.8 deaths to 10,000 living

The mortality from diphtheria in 1892 was 60% less than that of 1882, though the population has doubled. This great and steady gain is the result of obligatory notification, and constantly improving efficiency in enforcing isolation and disinfection by Local Boards of Health. The mortality in 1892 was 4.4% of all the deaths, and the average of the last six years was 5.9% of all death. The victims are nearly all under twenty years of age; 80% are under ten years of age.

But an annual loss of 650 children from this cause alone is an intolerable record if it can be reduced. The story of the past effort in our State is full of encouragement, and this new edition of the circular on the subject is intended to show how it can be made still better. Everybody can help, who will read what is here told, carefully, and then put it into practice; take every opportunity to impress it upon others; and support the Boards of Health in enforcing the law.

But it is with the bacillus, the germ and producer of the virus, that we have to do, to study what are the conditions most favorable to its lodgment and growth in the body. Most important of these, we are just beginning to know, is the health of the children exposed to the infection, and the freedom of their throats and air passages from wounds, or the effects of other throat ailments. A healthy child with a healthy throat is safer than one suffering from catarrh or recovering from scarlet fever or measles, but none are really safe in the presence of this most malignant of the infections of childhood.

The effect of temperature on the growth is noteworthy; that of the body is the most favorable, but it is in proof that it can grow at much lower temperature outside the body, and the common explanation that the known persistence outside the body is due to dryness, does not account for the fact that it lives and grows in moist, dark and damp places, at low temperatures—at least it does not always die there.

Moisture is absolutely necessary for the growth of the bacillus of diphtheria, but dryness does not kill it, for it may remain dry on clothing, bedding or any other thing out of exposure to direct sunlight for months, and then with favorable moisture, temperature, and soil, regain growth, infectiousness, and virulence.

How does the disease begin, and what are the first symptoms? It begins by the planting of the little germ, very likely many of them. They get into the mouth or nose in the air, or in or on solid or fluid food—on anything which is admitted to the mouth. (A five-year-old son of the writer swapping marbles, took from another boy an agate alley, which, as a test for color, he put into his mouth; that boy was convalescent from diphtheria. Minc had a nearly fatal attack.)

Do all who are exposed to the infection of diphtheria contract the disease? No; for if they did few would escape it.

The healthy mucous membrane, like all other healthy tissues of the healthy body, is endowed with a strong power of resistance to the attacks of the multitude of vegetable and animal parasites to which it is, sleeping or waking, constantly exposed, mostly coming in the air breathed and so lodged in the moist air passages. Poisons of this kind are domesticated, and most common in and about inhabited places, which partly accounts for the number of children who suffer; though not entirely.

Age at death.—Infants under one year of age suffer but 4.1% of all deaths from this cause in the average of six years (1887-92) in our State. While the other ages, under five, average about 10%, gradually increasing from one to five years.

Under five years of age the mortality was 43.4%. It falls off rapidly thereafter, e. g., 5 to 10 years, 35.2%; 10 to 15 years, 12.9%; 15 to 20, 3.5%; 20 to 30, 2.2; and 30 to 40, but .05%; 31 out of a grand total of 4,685 deaths in six years, or a yearly average of but five of 781 deaths from this cause.

This is an important fact—the mortality from diphtheria is very small after the 15th year of age—and after the 18th year not 3%. In our experience the occurrence of such cases has been associated with concentrated and prolonged exposure to the infection with the depressing influence of anxiety, fatigue, and sorrow. All these predisposing causes favor the infection and are proportionably diminished by cleanliness, and comfortable quarters for sick and nurse, good air and food, abundant light and cheerful conditions, as they are aided by close and untidy quarters, bad air, light, and food, with worry and care. The tired mother or nurse is the one who suffers most, and everything done to comfort and help her is a help to the patient and a hindrance to the infection.

How soon after infection is the disease likely to occur (the period of incubation)? Within a week, and probably four or five days, is the rule.

How to deal with diphtheria, either by prevention or restriction? We assume that the essential cause is a microscopic plant which comes from the diseased surface of the victim; that it is carried in the air as a dried powder on or as dust; attaches to clothing, bedding, furniture, the floors and walls of rooms occupied by the sick; on or in solid and fluid foods, particularly milk (one of the best culture fluids); upon pet animals, play-things, and books; and finally is contracted at the funerals of the dead. This last has happened so often in this State that public funerals are positively forbidden and private and speedy burial insisted on.

Outside the body, in clean, roomy, and well ventilated houses, and still better, in the open air, *the natural means of destruction*, are always at work. They are sunlight, oxygenation, alternate dampness and dryness, with warmth, and the operation of microscopic animals and other plants, a mixture of vital and chemical activities which are always compelling healthful exchanges of life and death between particles of dead and living matter.

In the body, and in the ordinary house and its contents, these agencies, while at work, are not under natural conditions and so work slowly, or not at all; we are therefore compelled to resort to artificial measures. These vary according as we have to deal with the infection in the presence of the person producing it, or after

the last case in a family had been disposed of. This distinction is a very practical and important one.

In a family living in a healthy house, where the sick can be entirely isolated from all association with the rest, except through the nurse, the well may escape the disease, and the method is easy and safe, provided the measures here advised are strictly followed. From such a family the out-door workers may go without danger to their business, but those whose work is indoors and likely to bring them into close and confined places with other people would do better to take other lodging till the danger is past.

How to do when the affected family is a large one, occupying a small house, is the most common problem we have to solve, and if such a family is of untidy habits, careless or shiftless, and do not employ a physician, it is not easy to decide. Let us take a family of this kind, poor, tidy, and intelligent, the reply will be more hopeful if the first case is promptly dealt with. The first thing to attempt (and it has repeatedly been done, particularly in country districts), is to remove the apparently healthy children to another building, if one is available, or to another family, where there are no small children, till the danger is over. The infected house in this way becomes a hospital, and the mother has leisure to attend to the sick while the other children are removed from further danger, and should one or more take sick he is immediately returned to the home.

But suppose the well children cannot be moved in either way suggested, what is the next best thing to do? The infection of the disease escapes from the body almost exclusively in the discharges from the mouth and nose, so that if they be destroyed immediately on escape, the danger to others is reduced to a very small chance.

This should be done from the first symptom till three weeks after recovery. An attentive nurse can easily manage it by collecting all the discharges on cotton or linen rags and immediately burning them, or easier put them directly into a dish of lime water (described farther on) and at regular times burn them. She must see that all soiled clothing, bedding, towels, handkerchiefs, wash-cloths or other articles used about the sick are, immediately after use, put into hot water and boiled, as this will kill the virus surely, and such things may then go into the common wash with safety. Always wear a calico wrapper in the sick room, covering the dress entirely; when soiled put it in boiling water immediately. Wear a linen or cotton cap to cover your hair, treating it as the wrapper, and always wash hands and face when about to leave the room. Keep every one else from the sick room, and if they must come let them wear a wrapper and cap as you do. It is only in this way that you can be sure you have done the best thing.

The well children should be kept as far from the sick as possible, and when the weather permits out of doors, in granary, barn, or under other shelter for play.

What is the duty of a Local Board of Health to such a family? Isolate them thoroughly from association with others, except as permitted by the Board and let this include the house and lot so that the well children need not be confined to the house but may play outside, as can be done in the ordinary town lot and on the farm under the direction of the Board. The Board is to offer the family every assistance possible, see that they have means of communication with others, doing errands, sending for the doctor; in short, all that can be permitted with safety to others. If a poor charge, everything needful is to be provided by the Board. (See Sec. 29, Chap. 132, Laws 1883.)

But if the infected family is one of a number occupying a dwelling with other families, what then? The safest way would be to remove all well children to another and isolated house (in default of a hospital or retreat), but much can be done in the ways above suggested.

Care of the sick of diphtheria when too much for the mother, with the help of older children? is one of the most pathetic questions asked of the Secretary by Chairmen of Township Boards. *It is a shame that with so many trained nurses, sisters, deaconesses, and other single women able to serve, there is no supply for such a demand as this?* Our files are witnesses of the urgency of this call in remote country districts and among the poor, where more than one patient and worn-out mother has followed the last of her children, by the same disease, to the grave. Some of the lack is due to an exaggerated fear of the disease by women over thirty years old. Not one in a hundred, after that age, exposed to the infection, take it, nor one in a hundred taking the disease die of it. Their only real danger is the carrying infection to others, not to take it themselves.

Is the father, or other bread-winner, to be kept from his work because he has a child sick of diphtheria? In the case of one dependent on daily labor for daily bread, if he must stay at home, it is real economy to allow him wages for public safety. If he can arrange to keep clear of exposure, to the satisfaction of the Board, he should be permitted to go to work, and the best way is to lodge and board

elsewhere, visiting home under the same sanitary restrictions as the physician or clergyman. This ought to be insisted on in the case of a store, grocery, saloon, or similar business; the proprietor and clerk must not expose others to infection; they must board and lodge outside the infected family if they are to attend to their work. Of the details each Local Board of Health must be the judges.

When is the isolation to be removed from a family where there has been diphtheria? Not until at least three weeks after the recovery of the last case in that family, and not then unless thorough disinfection has followed.

How to DISINFECT:—*Begin with the patient immediately the disease is recognized*, using the means already described, constantly and thoroughly, so that when the case is terminated there will be little else to do than to deal with bedding, furniture, and room. *Do not be persuaded to use little "smudges" of sulphur or any other odoriferous thing.* When the air is foul ventilate by letting in fresh air, but do not make it worse by still another "smell."

1. *Clothing, Bedding.* Everything which will bear boiling water (it is well to add soap but nothing else, nor even that necessary), can be absolutely disinfected by its use, and fifteen minutes' hard boiling is enough. This simplifies the matter very much—boiling water is a perfect disinfectant, none better except alternated superheated air and steam, which are not available at present even in cities. The contents of mattresses of straw, excelsior, moss, and the like, should be burned, the ticks, if worth it, can be safely dealt with by water; *featherbeds*, should be disinfected first by steam and sulphur, as above, then opened, the feathers scalded, and dried in the open air, and tick washed. Cotton quilts are sanitary abominations and after use in diphtheria are better burned though they may be boiled, for at least one hour, and be safe.

2. *Sulphurous fumigation.* Arrange bedding, carpets, etc., so that the steam and gas can reach them readily, close all openings of the room but the door, and fill the air with the vapor of water from a boiler on the stove, if there be one; if not, then fill a wash-tub in the middle of the room with water as hot as possible and close the door. As soon as the water has cooled dip out all but about two inches in depth; put in two or three bricks, and upon them put an old frying pan or kettle containing two pounds of sulphur for each 100 cubic foot of space, using more than one tub and kettle if the space is greater. Pour on the sulphur two ounces of alcohol, light it and go out closing the door, and leave it closed for twelve hours.

After fumigation, open doors and windows, put the bedding and mattresses out doors to get sun and air, wash the floors and furniture with hot *soft* soap-suds; take off the paper from the walls and wash them in the same way. *Lime-wash the ceiling and if not to be painted, do the same for the walls. Do not use wall paper. Leave all open to the sunlight and air till thoroughly dry; if the floor was painted, repeat it; if not saturate it with boiled linseed oil, which is the best treatment for floors either for care, appearance, or health. After the most thorough disinfection prevent children sleeping in the room for at least a month, and until it has been repeatedly cleaned and ventilated.

The influence of schools, and other public gatherings of children upon the spread of diphtheria, may be inferred from the number of deaths from this cause at the school-going age, 50% of total, a very powerful argument for school teachers to co-operate with Boards of Health as required by law.

"No principal, superintendent, or teacher of any school (public or private), shall permit any child having scarlet fever, diphtheria, small pox, or any dangerous, infectious or contagious disease, or any child living in any house in which any such disease exists, or has recently existed, to attend any public or private school until the Board of Health of the town, village, borough, or city, shall have given permission therefor; nor in any manner to be unnecessarily exposed or to needlessly expose any other person to the infection of any contagious disease."—*Sec. 26, Chap. 132, Laws of 1893.*

(A circular to school teachers on "Health of Children in the Schools," can be had of the Local Boards, or of the Secretary S. B. of H., at Red Wing.

Disposal of the dead of diphtheria. Immediately after death the body should be wrapped in a sheet saturated with strong lime water, put in a tight coffin, and taken to the grave with no other assistance than is required for reverent, decent, and private burial. This to avoid the *known danger* of infection from the dead of this disease.

All cities, villages, and townships, should have a properly built "*House of Refuge*" for the well children of infected families. (Plans will be furnished by the Secretary on application.)

All cities and villages should have a *disinfecting plant*, for using living steam and dry heat of 212° F. alternately, to destroy infection in clothing, bedding, etc.

C. N. H.

* *Lime water* is the clear solution of *quick-lime*. Take best quick-lime in lumps, put in a pail, pour on one-third as much of water, cover closely and slack till it is a fine powder or creamy fluid; one part of this to three of water will make a saturated solution. Add water in that proportion to the mixture, stir well and then pour on half teacup of kerosene, which will protect it from the air and preserve its strength. Use the clear solution as needed, and the semi-solid matter can be made into whitewash or thrown into privy, cess-pool or garbage barrel. Always use "*soft* (potash) *soap*" for cleaning floors, furniture, and the like after infectious diseases; it is a powerful disinfectant.—C.N.H.

SCARLATINA.

(SCARLET FEVER, SCARLET RASH, CANKER RASH, MALIGNANT SORE THROAT.)

WHAT IS IT? HOW DOES IT SPREAD? HOW TO PREVENT OR CONTROL IT.

NOTE.—This tract is for free distribution by Boards of Health, and others interested in the prevention and control of infectious diseases. Apply to any Health Officer, Local Board of Health, or directly to Dr. Hewitt, Secretary S. B. of H., Red Wing.

SCARLET FEVER is one of the infectious diseases distinguished by its peculiar rash or "eruption."

Our statistics, added to actual experience, show:

That Scarlatina is most fatal in young children under five years (65%).

That 33% of all deaths occur in school-going children.

That it has not proved fatal, in the last five years in Minnesota, to persons over thirty years of age.

That it is most fatal in the Spring, but mortality begins to rise in the late Fall, and increases till May.

That the mortality, to number living, is greatest in the larger cities and least in scattered population.

That these statistics support conclusions based on other evidence that the disease is spread largely by personal contact and infected clothing, chiefly by the last.

That schools are largely instrumental in spreading Scarlatina as above.

That the isolation of the sick and of infected persons, with thorough disinfection of persons and things, are our most reliable measures to control the disease.

The additional facts of this disease needful to be known for its prevention or restriction are:

1st. *That its special infection is developed in the eruption in the skin, and given off in tence to persons and clothing, and to bedding and other things in occupied rooms, and that it continues to be given off constantly till the skin is entirely well and all scurf or scurfiness has disappeared (5 to 8 weeks).*

2d. *That the slightest attack in one child may provoke a severe attack in another exposed to it, and that in epidemics the large proportion of attacks are so slight as not to be recognized until they have given infection to others, or till albumenuria or other sequel of the disease show where it has been.*

3d. *The period of incubation (time from taking infection till first symptom appears) is rarely longer than seven days, sometimes but a few hours—average 3 to 4 days.*

4th. *The patient is infectious, and so dangerous to others, for at least 40 days, and, as a rule, 5 to 8 weeks, i. e., till the skin is free from all scurf, particularly the palms of the hands and soles of feet. The recovery is hastened by free inunction during the whole of sickness, and soap and water baths after the acute stage has passed.*

5th. *The infection preserves its virulence in the clothing of the patient nurses or visitors, which (without disinfection) are hung in closets or packed in trunks, for months, ready when the article is handled, shaken or worn, to float off and be breathed by the nearest child.*

6th. *Boiling water will destroy infection in all that can be subjected to it as will steam.*

A strong solution of common quick-lime will do the same for floors, walls and ceilings if freely applied as will a strong and hot solution of soft soap.

7th. *Inunction of the whole body is best made with an ointment (one part mutton tallow, or white wax, to two parts fresh lard, melt separately, mix, and stir till cold). Its use relieves fever and itching of the rash, and confines loose particles of skin to the surface of body, to body clothing, or sheets.*

This should be repeated daily till skin is entirely well, subject to the regulation of the medical attendant.

The above brief of needful facts is italicised to impress their importance upon Boards of Health and the mothers of families. They are the foundation upon which rest the measures we are to take to prevent or control Scarlatina. The measures most likely to secure the safety of the infected family and the community are the following:

Isolation of the sick, with the nurse, from all association with the family or other persons, in the most secluded room available and outside the family if possible. (Where isolation hospitals do not exist this is very difficult.) The room should contain no more furniture, carpets, rugs or window hangings than are required for the use and comfort of the sick. All clothing, bedding, and other needful things should be kept scrupulously clean. (Never use feather beds or comforters, but hair or straw mattresses and blankets.) The nurse should have two calico wrappers, covering the clothing from neck to wrists and feet, for alternate use. The ventilation, warming and lighting of the sick room should be independent of the rest of the house. (Currents of air *from* it would be the means of distributing the infection.) The patient should be anointed from head to foot daily with some simple ointment (*see above*) and the clothing, both of patient and nurse, sheets and pillow cases, towels, handkerchiefs and the like, should immediately after removal, be plunged into hot water in a covered boiler and boiled for twenty minutes, when the virus they may have contained will be killed and all danger from that source removed. Dishes used in the sick room should be treated to boiling soap suds as soon as used, and food *from* the sick room burned.

After the recovery, or death, of the sick from Scarlatina, if the above precautions have been faithfully taken during the entire sickness, the disinfection necessary will be that of the room, bedding and furniture, and of the clothing last worn by patient and nurse. All things that can be boiled should be soaked in a vessel of hot water *in the room* and then boiled as above directed. Before cleaning the room saturate the air with steam from hot water, then wash all furniture with scalding soap suds to which has been added "washing soda" freely; then put the furniture out of doors to dry. (Upholstered furniture, feather beds and pillows are difficult of disinfection and must be treated as advised by the health officer in each case.) The floor, walls and ceiling of the room should be treated to *hot fresh lime water** with a whitewash brush. If there is paper on the wall this method will disinfect, and make its removal easy. (All paper scraps and dust should be burned.) These things done, open the windows, keep up the fire and dry the room. Ventilate in this way for two or three days, if possible, then scrub and clean the floor, and wood work, oil or paint them, and repeat the whitewashing of the walls and ceiling.

Disposal of the dead of Scarlatina.—Immediately after death the body should be wrapped in a sheet saturated with strong lime water and put into a tight coffin. If the weather permits it should be cooled to freezing as soon as possible. When cofined it should be removed directly to the grave with no other assistance that is required for decent and private burial. This is necessary to avoid infection from the body of the dead.

The well children of the infected family are best cared for in another building or in other families where there are no children, and isolated there for at least a week before being permitted to go to school or on the street. Any who get sick are immediately returned to the home—for the time being a hospital.

The relation of schools and public gatherings to the spread of Scarlatina.—This disease caused nearly 7% of the total mortality by infectious diseases in the schools of the State during the past four years, and 33% of its total mortality at all ages, was at the school-going age. C. N. H.

* LIME WATER is the clear solution of quick-lime. Take best quick-lime in lumps, put in a pail, pour on one-third as much of water, cover closely and slack till it is a fine powder or creamy fluid; one part of this to three of water will make a saturated solution. Add water in that proportion to the mixture, stir well and then pour on half tea cup of kerosene, which will protect it from the air and preserve its strength. Use the solution as needed, and the solid matter, mixed with more water, can be made into whitewash or thrown into the sewer or out-house.

ENTERIC (TYPHOID) FEVER.

An unfortunate familiarity with this disease, by both physicians and people, has helped us to forget its constant sickness and mortality rate, and its fatality among the very flower of our population. As evidence here are the averages for five years from the Vital Statistics in Minnesota based upon a study of 2,903 deaths from that cause alone.

Average mortality 50 a month and 581 per annum, nearly 5 per cent of the total of deaths from all causes; 61 per cent of victims are males, 39 per cent females; 37 per cent are between the ages of 20 and 30 years, and nearly 70 per cent are between 15 and 40 years.

NATIVITY.	PR. CT.	PARENT-NATIVITY.	PR. CT.
Born where died.....	9.98	Both parents American.....	14.63
Born elsewhere in Minnesota.....	12.40	Both parents Foreign.....	66.95
Born in other U. S.....	20.65	One parent Foreign.....	4.51
Foreign-born.....	52.67	Unknown parentage.....	15.01
Birthplace Unknown.....	4.06		

WHAT IS ENTERIC (TYPHOID) FEVER?—A slow fever usually characterized by a persistent diarrhoea after the first week. It is peculiar also in having a regular rise of temperature from morning to night, of 2, 3, and even more degrees. If any rash occur, it is on abdomen from 5th to 8th day of fever.

The period of incubation is long—21 and even more days—average 15 days. Duration of acute disease—average 3 weeks. Convalescence, 5th week. Relapses, frequently. “Walking Typhoid” is a not uncommon variety particularly among men dependent upon daily labor, and needs careful watching as a dangerous means of spreading the infection.

The Virus of Enteric Fever is generated in the bowels and discharged, capable of living in privies, sewage, on or in soil, for an indefinite period.

Locality—Anywhere that its infection finds a soil for growth.

Season—Spring, 12.95 per cent; Summer, 18.08 per cent; Fall, 46.50 per cent; Winter, 22.46 per cent. *Locality*—In cities over 5,000 population, 53.2 per cent; under 5,000, 46.8 per cent. Deaths to 100,000 population—In localities of over 5,000 population, 76.3; under 5,000, 30.1.

In Minnesota, therefore, the deaths increase as a rule, with density of population. (See 3d Biennial Report, Vital Statistics, p. 132 and after.) It has occurred frequently in railroad camps and other collections of laborers, in temporary and crowded quarters, with illy prepared food, and careless disposal of excreta. In townships the disease can often be traced to importation by persons taken sick in cities and coming home, and the prevalence is a family one.

Where does it come from?—The bowels of a previous case; entering the mouth in water, milk and other food. It reaches the small intestines where it finds congenial soil and temperature, reproduces its kind rapidly and in large amount and thence attacks its host. The body's attempt to get rid of it by diarrhoea, distributes the infection wherever the discharges may fall. Thus it happens that "hole-in-the-ground" privies, cess-pools, and other receptacles of excreta, including sewage into streams, are the means of distributing the cause of Enteric Fever, largely by infecting water, milk, and in other ways.

How to prevent the disease? is answered to a considerable extent by the facts already stated. So to arrange our methods of collecting and disposing of excreta that should they contain this infection, it shall have no opportunity to spread and, if possible, be immediately destroyed.

Enteric Fever is near akin to Asiatic Cholera.—Both are "filth diseases;" both have a specific cause, cultivated in the bowels of the victim and escaping in his dejecta. Both can be "crushed out" in the same way. Neither can exist except in isolated cases, in a "clean" city, town or village, i. e., one in which there is no possibility for human excreta to foul the soil, water, or air of inhabited places.

How to deal with a case or cases of the disease.—Provide for the sick a-bed that all discharges be received in a vessel where is already at least a pint of the lime water described in foot-note. The mixture should be shaken or stirred, and after at least a half hour, may be poured into earth or water closet, or better, buried in garden soil a foot deep. For "walking cases," which includes all able to go to the closet the same method should be insisted on, if possible, but here is the practical difficulty as respects water closets which we are not yet able to surmount. When an above-ground closet is used (water tight) the addition of lime water two or three times daily will be, with the dry earth, sufficient for the destruction of the infection. The "dry earth closet" solves the difficulty better than anything else now known, if used as directed in the circular on "Disposal of Excreta and Garbage," to be obtained of any Local Board of Health or of the Secretary of the State Board, address Red Wing.

Any householder can in this way, protect his own family from the infection of Enteric Fever and Cholera by way of human dejecta, and having done so should insist that his Local Board of Health require other householders to do the same thing.

H.

Lime water is the clear solution of *quick-lime*. Take best quick-lime in lumps, put in a pail, pour on one-third as much of water, cover closely and slack till it is a fine powder or creamy fluid; one part of this to three of water will make a saturated solution—best kept in a large earthen jar. Add water in that proportion to the mixture, stir well and then pour on half teacup of kerosene, which will protect it from the air and preserve its strength. Use the clear solution as needed, and the semi-solid matter can be made into whitewash or thrown into privy, cess-pool or garbage barrel. Always use "*soft (potash) soap*" for cleaning floors, furniture, and the like after infectious diseases; it is a powerful disinfectant.

SMALL-POX.

Its Cause, Prevention and Control.—Vaccine and Vaccination.

SMALL-POX (*Variola*, *Varioloid*) is a very infectious, eruptive disease which, before the discovery and use of vaccine (cow-pox) was the most virulent and fatal of plagues, differing from all others in prevailing at all seasons of the year, among all nations, and sparing neither age, sex or condition.

It is just as virulent and fatal to-day, in unvaccinated persons, as it ever was, and its diminished prevalence, changed character, and loss of epidemic power are due to the wide and continuous use of vaccine, and to that, almost, alone. Isolation and disinfection are valuable helps, but no substitutes.

Where does small-pox come from? Hitherto, in Minnesota, it has come almost entirely in the baggage—hand baggage mostly—of immigrants from abroad, but for the last four outbreaks (since September, 1893, and the first since June, 1891), it came every time in the person of its first victims.

When is a patient infectious? Possibly from the beginning of the fever, but always from the first appearance of the eruption till the last crust falls off and the patient has had a thorough, all-over bath.

How is it spread? Often a single and momentary exposure to the infection of the sick room is enough. The dead body is infectious, and the clothing, bedding and the like will retain the virus, in a dry and dark place, for months. The same is true of carpets, floors and the walls of rooms, for the disease has spread in this way, and repeatedly, in our state. From a single case in Wadena, a few years ago, the infection was carried, by persons not sick when they left Wadena, to another Minnesota town, to Winnipeg and to the Yellowstone. It will be easily understood, therefore, how important is the promptest isolation of persons, clothing and baggage reasonably suspected of the infection.

How to prevent it. By vaccination and revaccination, as described at the end of this memorandum.

Boards of Health are not omniscient, and every citizen and parent should report to them, in person or by messenger, any rumor, or fact, of the disease that comes to them. But do not wait a moment to insist that suspected persons keep isolated till the Board have acted, for much danger may be saved by such action as a few determined people may take before the Board are in charge. If the Board find there has been exposure, or a reasonable probability of it, it will first secure strict isolation of persons, clothing and baggage; then the vaccination or revaccination of all exposed persons; then a thorough hot bath for each of them, and a boil of half an hour in water for all clothing and baggage which can be treated in that way.

How to manage a case.

I. Remove the patient to a separate building (if no hospital is available), and in warm weather it is better and more comfortable for the patient to use wall tents. A nurse should be vaccinated before taking charge, and is then practically free from danger.

II. Everything that the patient has used should go with him, clothing, bedding, baggage, and then the room he occupied should be disinfected with steam and sulphur fumes under the direction of the Board of Health, scrubbed, whitewashed with quick-lime and thoroughly dried with free ventilation. Nothing need be destroyed except feather beds or pillows used by the patient, which it is safer to burn. There is no occasion to destroy sheets, blankets, underclothing, or clothes (if otherwise worth saving), and much less to injure or burn furniture or buildings; all can be easily and surely disinfected.

III. The buildings or tents occupied by the patients should be in an airy, dry and properly sheltered place away from traveled roads, near to water if possible, and every provision made for their comfort and care. There would be less difficulty in getting good nurses if people would trust their vaccination as the writer and all active Health Officers do. A recent successful vaccina-

tion or the failure of a recent use of active vaccine to take, is satisfactory proof of safety.

What to do for persons exposed to the infection. All should be vaccinated or revaccinated immediately and isolation till disinfection of persons, clothing and baggage.

The vaccine will "take" if at all, so as to be recognized on the fourth or fifth day, and will be at its prime and protective on the eighth day, when all who have this evidence of safety may be discharged. Those upon whom tested virus does not produce any or but aborted vesicles, may, if they have scars of recent successful vaccination, be discharged, too, on the eighth day, while those who refuse this test must remain the full period of the incubation of small-pox (i. e., the time between exposure and local evidence of the disease in the eruption, twelve to fourteen days.

But what is vaccine? It is the virus of a peculiar affection of cattle, which if carefully cultivated on young and healthy calves, can be used with perfect safety upon man. It is carefully collected on ivory points, in sterile glass tubes and in other ways, and so preserved for distribution and use.

How is it used? Vaccination is the insertion of this virus by minute punctures, or scratches into the skin. Five little punctures result, after four days, in the formation of as many little vesicles which on a healthy infant look "like pearls on a rose leaf," by the day week, gradually dry up to crusts which fall off in due time, leaving little peculiarly pitted scars, proof of the character of the operation.

When should vaccination be done? When repeated? After the third month of age is the best time, as infants suffer least of all from the operation. All others who have never been vaccinated should immediately get it. *Five insertions give the greatest security with no additional trouble.* Revaccina-

tion should be done after puberty, *and at any time when one is directly exposed to the infection of small-pox.*

Is vaccination a protection against small-pox? Yes, if the vaccine is pure and fresh, and if it is used as above directed. The writer has been directly and repeatedly exposed to small-pox in more than forty distinct outbreaks, and has been revaccinated many times, yet the vaccine has never taken again since childhood, nor has any one of the revaccinations ever produced other than trifling effect.

Where can pure, fresh and reliable vaccine be obtained? At the Minnesota Vaccine Station, Red Wing, where, after a careful study of the methods of selecting, cultivating, preserving and using of vaccine in Europe and this country, we are cultivating a pure virus upon healthy nursing calves. It has been tested with the greatest care in over 20,000 cases, with the typical results.

The object in view is to supply vaccine virus of the greatest purity and efficiency by the most careful selection of healthy calves which are tested as to healthfulness in every practicable way; their vaccination is done with every safeguard; they are watched and have every attention till the vaccine is ready for removal; it is taken with all tested precautions, and as carefully sealed up for distribution. A report of its operation is required of all to whom it is sent, so that the slightest variation from its normal operation can be immediately investigated with samples always reserved for the purpose. It is now nearly three years and not a complaint has come back with the reports of its use. The station in this way has removed the last objection to the use of healthy vaccine, and with the hearty co-operation of the medical men and people of the state bids fair to restore the practice of vaccination to its old-time frequency and value. C. N. H.

THE MINNESOTA VACCINE STATION

RED WING.

ESTABLISHED 1890.

CHAS. N. HEWITT, A. M. M. D., DIRECTOR.

For the Cultivation and Supply of Fresh, Pure and Typical Vaccines, under Every Possible Safeguard.

NOTE.—Should the experiment now making here for the production of the Antitoxine of Diphtheria succeed, notice will be given; until that notice, none will be sent out.

VACCINIA (CALF LYMPH).

Use, to prevent, or moderate the severity of, Smallpox. Furnished at present on ivory points only. (*Put up in packages of ten points, and best ordered in multiples of that number.*)

RED WING, MINN.....189.....

Replying to yours of.....

To.....

.....
"The typical vaccine vesicle of the eighth day resembles the section of a pearl on a rose leaf."—Jenner.

Herewith find..... points charged from Calf No..... which, if kept unopened, in a cool, dry, dark place, should be fully active till

N. B.—It must be clearly understood that this virus is..... on the following invariable conditions.

- I. *The invariable notification of results of use on the day-week (for which postal card accompanies every sample). It is only by knowing the operation of each sample that the producer can keep the virus to its normal activity, and correct any irregularity.*
- II. GRATUITOUS SUPPLY is afforded for these purposes:
 - (a). To Local Boards of Health in Minnesota for persons directly exposed to the infection of Smallpox, and to enable Health Officers to begin production of humanized vaccine from healthy children.
 - (b). Sample supply (enough for three vaccinations) to physicians for first trial.
 - (c). To replace samples sold which fail to produce a typical vesicle in primary vaccination, when used as directed and results reported on the day-week as required in I.
- III. **Sale of Vaccine.**—*All orders must be accompanied by the money, postal or express order, or bank draft. In emergency, "payment mailed" must be a part of the telegram. This rule is imperative to prevent loss to buyer and seller, and to avoid keeping petty and vexatious accounts.*

Prices of Vaccine on Points.—One point, 20 cents; two points 30 cents; three points, 40 cents; four points, 50 cents; five points, 60 cents; ten points, \$1; twenty to fifty points, at the rate of \$8 per hundred; fifty to one hundred points, at the rate of \$7.50 per hundred; over one hundred points in one order, \$6 per hundred.

Address all correspondence and payments to

CHARLES N. HEWITT, M. D.,

RED WING, MINN.

RABIES.

*A PAPER DESCRIBING THE DISEASE AS IT APPEARS IN
DOMESTIC ANIMALS AND MAN.*

WITH DIRECTION FOR ITS RECOGNITION AND MANAGEMENT BY
LOCAL BOARDS OF HEALTH.

COPIES FOR FREE DISTRIBUTION MAY BE GOTTEN OF LOCAL BOARDS OF
HEALTH, OR OF THE SECRETARY OF THE STATE
BOARD, RED WING.

PREFACE.

This paper is addressed not only to the State Public Health Service—Boards of Health—but to every citizen interested in the history, and methods for control, of this dreaded disease.

The object is to tell the simple truth about Rabies and thereby disprove and abolish the absurd statements and beliefs now so common. They have caused much needless, but none the less real, mental and physical suffering, and stand directly in the way of the efforts, proper to be made, for the prevention and control of the disease.

Rabies is a real and dangerous affection. It may occur at any time if a rabid animal bite others, or man, but not without that cause, for it never originates from other sickness, nor in any other way than by some kind of inoculation from an animal having the disease.

Everyone sympathises with the instinctive dread of Rabies because every one feels it. The bravest and largest dogs run away from a "rabid" poodle.

The popular dread of the disease had another justification hitherto, in our confessed ignorance of its real origin, character and symptoms. There were only the apparent symptoms to distinguish the false from the true, a real from a needless alarm, a harmless from a dangerous bite. If the disease did exist we knew little of the probabilities of its conveyance by a given bite, or of the duration of its incubation before its active attack.

These doubts were often as serious, almost, as the disease itself. It is not so now. Pasteur and his followers have cleared away many doubts and replaced the wildest speculation by incontrovertible truth. They have made it possible for the feeblest township Board of Health to do more for the prevention and control of Rabies than the strongest city Board would have attempted a few years ago.

The first step, in taking which Boards should have the hearty support of the people they serve, is to order the registration of all dogs and that they wear a suitable collar and tag as evidence of the fact.

Should there be reason to suspect the presence of the disease, every dog running at large should also be required to wear a muzzle sufficient to prevent the possibility of its biting other animals and men. To these rules should be added the other one that the Local Board of Health catch all dogs suspected to be rabid and isolate them for a week or ten days to verify the character of their disease. As it is not always possible to take such animals alive, it should be the rule, when those killed are reasonably suspected to have had the disease, to arrange for further experiment, as advised in the following paper.

If the suggestions here made are carried out we shall hear less of Rabies, but what is reported will be nearer the fact, while if the disease does occur, it will be possible to act promptly, not only for any who may have been bitten, but for the extinction of the affection itself.

It is proper to state that in 1890 I made a special study, with Pasteur himself, of his treatment for persons bitten by rabid dogs, with a view to the establishment of a "Pasteur Institute" in Minnesota, under the auspices of the State Board of Health should it be found to be needful, for which no further steps have been taken.

I would not hesitate a moment to use that treatment for myself, family or friends, as the only way to safety now known, and shall be glad to advise any persons thought to be bitten in this way as to the proper course to pursue.

Red Wing, Dec. 20, 1892.

C. N. H.

RABIES.

(FALSELY CALLED HYDROPHOBIA.)

Boards of Health deal with Rabies as with any other infectious disease of men and animals under Chapter 132, Laws of 1883, and Chapter 200, Laws 1885, and will promptly notify the Secretary of the State Board of the history of such cases and their action as provided in Section 18, of the first named law and Section 12 of the last.

Distribute this circular freely when there is excitement on the subject, and promptly test every suspected animal by confinement as suggested, or, if killed, by sending the head as directed, or the brain carefully removed and sealed in a suitable jar of pure glycerine, to the Secretary for the Pasteur test.

WHAT IS IT? An infectious, and fatal disease of the nervous system. Its specific poison is communicated by the bite of an animal having the disease and so by inoculation under the skin. *The virus does not operate through the unbroken skin, nor by way of the digestive canal.*

WHERE DOES IT COME FROM? In our State all reported outbreaks have been associated with the appearance of a strange, and angry dog, with a single exception when a cat was reported to be the biter. In other countries the wolf and fox have been blamed.

HOW TO PREVENT THE DISEASE. This can be done, surely, in the following way. Compel the owners of dogs to register them and provide them with evidence of the fact by a collar and tag. In the presence of affected or suspected animals, require all dogs running on the highway, to be muzzled, and tagged, on penalty of pound and fine, or slaughter on sight.

A DOG IS FOUND RUNNING AT LARGE, ACTING STRANGELY, OWNERLESS, AND SUSPECTED OF RABIES, WHAT SHALL BE DONE WITH HIM?

If possible catch and confine him in a quiet, roomy, and comfortable place where he can be watched, fed and kindly treated till a few days' time develop the character of his disease, if he have any.

WHY DO THIS RATHER THAN KILL HIM ON THE SPOT? For very important reasons. The probabilities are altogether against his having Rabies.

If he has the disease, under the circumstances of his capture, a few days will tell the story.

If a person has been bitten by him this is the way to get an answer to the question, Was the dog mad when he bit?

If the suspected animal recover his health and spirits he was not rabid.

If he seem to recover and after a week give evidence of the disease, the person bitten before his arrest is safe. The animal may then be killed and his brain used for the further test described below.

Saving, caring for, and watching a suspected dog will, in the majority of cases, prove the character of the disease with which he is charged, and in a few days. Kill him and there is no way to quiet the popular excitement which usually accompanies the suspicion of this dreaded affection.

BUT SUPPOSE, AS IS UNFORTUNATELY THE RULE AT PRESENT, THAT THE SUSPECTED DOG HAS BEEN KILLED, WHAT THEN?

Cut off his head and send it (packed in ice if the weather be warm) by express, charges paid, to Dr. Hewitt, Red Wing, for the Pasteur test, with a detailed description of the case and of the outbreak associated with it.

A PERSON HAS BEEN BITTEN BY AN ANIMAL SUSPECTED TO BE RABID, WHAT MUST HE DO?

Suck the wound instantly and thoroughly; if on an extremity bind a handkerchief or other band snugly around the limb between the wound and the heart, so as to encourage free bleeding. Cleanse the wound with simple hot water or saturated solution in hot water of Boracic Acid, which also promotes bleeding, and dress with frequent renewals of the same, or a saturated solution of Boracic Acid in glycerine.

The experience of Pasteur and his aids, with a practice vastly greater than anyone else with Rabies, is that the use of strong caustics, and of the red-hot iron, is of no benefit but rather an injury.

The wound once thoroughly cleansed as directed above, should be permitted to heal.

Persons who have been bitten by suspected animals should understand that not more than 16 per cent. of persons bitten by dogs, actually rabid, take the disease, and that, despite the number of outbreaks reported in our State, there is no positive evidence that the disease, in any case was Rabies. Some of the reports, and that by physicians too, state that children supposed to be affected, bark and imitate dogs in other ways. Attention is called to the descriptions of the symptoms of true Rabies in dogs, cattle, and men, which follow, and the hearty co-operation of all intelligent folk is asked to give this circular as wide distribution as possible, that the gross popular misapprehension as to the dreaded disease may be replaced by a reasonable comprehension of the facts.

RABIES IN THE DOG. The following description we translate from "La Rage," by Dr. Jean Renaud Suzor, Paris, 1887, a pupil of Pasteur's.

"There are two forms of Rabies in the dog; the furious type, in which the animal is delirious and disposed to bite; the mute or paralytic form, in which the dog is silent and paralysed.

I. RABIES FURIOUS. (a). The character of the animal is changed, his behavior is different, he becomes sad and silent, hides himself in dark places, away from noise and tries to sleep, but his sleep is troubled by painful dreams, he starts up, takes a turn, shakes himself and lies down again. He is in a state of constant agitation, or perhaps, in certain rare instances, he is dull, and careless to everything around him, and if one stirs him up he growls but shows no inclination to move. In either case he still obeys the voice of his

master, and shows no inclination to bite. Then his restlessness increases, and if he is in his kennel he piles up the straw of his bedding and buries his chest in it, but finding no relief, he tears it down and scatters it about in rage. In the house he tears the cushions and carpets. In certain cases he exhibits a very lively and inexplicable attachment to another animal or to some persons in the house; at other times he is found licking cold objects. He has visions and hallucinations, he growls, barks, and throws himself on imaginary beings which he seeks to destroy. If you hold a stick towards him he bites it, and without much provocation, he bites strangers. All this time he knows his master but his saliva is already virulent and his caresses are to be avoided. The saliva is virulent at least eight days before the symptoms of the disease are well marked.

(b). *A rabid dog has no dread of water* (hydrophobia) but on the contrary, at all stages of the disease, he drinks with avidity, or attempts to do so. When he fails to drink it is from an involuntary contraction of the throat which prevents the act. His appetite may be temporarily increased, but is soon totally lost and replaced by a perversion of taste which drives him to spurn his accustomed food, though he throws himself with voracity upon the most incongruous things. So he destroys and attempts to eat bits of wood, straw, his own excrement, his urine, dirt; they are equally acceptable. At this stage he vomits frequently, and the matters rejected are often tinged with blood, due often to the habit of swallowing things which lacerate the walls of the stomach.

(c). *The bark of the rabid dog is characteristic* and never forgotten when once heard. Boulay describes it as follows: "It is remarkably modified in its sound and its method. Instead of bursting out with normal clearness and consisting in a succession of barks of equal duration and intensity, it is hoarse, subdued, with a lower tone with the first bark given full mouthed, and followed immediately by five, six or eight howls which come from the bottom of the throat, and during the emission of which the jaws are but partially closed instead of closing each time as in the normal bark." Youatt describes this peculiar bark nearly in the same terms.

(d). *The sight of another dog rarely fails to provoke a furious outbreak in a rabid dog*, which constitutes a sure and valuable test of the existence of the disease. The effect is the same in all rabid animals and includes even the peaceful sheep. Man is the only susceptible being who is an exception to this rule. This symptom of fury at the sight of another dog has a peculiar value when one is dealing with an animal which has always exhibited a character gentle and inoffensive.

(e). *In well established rabies the sexual instincts are strongly excited*. In some cases the animal remains gentle and affectionate to the end, but as general rule there soon appears a state of delirious fury the interpretation of which is only too easy. He bites and tears everything thrown in his way if shut up or chained, and if at liberty attacks every animal he meets, and soon, man himself. Still he attacks strangers before his master, and animals rather than men. His pupils are dilated and his whole bearing expresses the highest degree of ferocity and cruelty. A rabid dog is silent when tearing his victim, differing in that respect from the healthy one who growls and makes

a great hubbub all the time he is fighting. *'At some period of this disease the dog often leaves his home and wanders away.* At a distance he exhibits no peculiarity which would reveal his condition, he keeps his accustomed gait, his tail is erect swinging from side to side as is customary, and does not hang down or between his legs as is so often said. Later on when he is tired his step becomes unsteady and languid, the head hangs low, and the pointed and bloody tongue lolls out of the mouth, the tail hangs listlessly, the sight is failing with the other senses, the animal is less dangerous, but he is not to be trusted; his saliva is more virulent than ever, he can still bite, he is found sometimes, at this stage, lying in ditches alongside roads. After wandering in this way for many hours, even days, he often returns home, where he awakens a pity on the part of persons who ignorant of his condition and without distrust are eager to welcome, to caress and to feed him. About the fifth day, emaciated, exhausted, though more by repeated outbreaks of fury than by lack of food, already paralyzed in the hind-quarters, he surrenders at last, to exhaustion and to paralytic asphyxia.

MUTE, OR PARALYTIC, RABIES IS A VARIETY OF THE DISEASE. The periods (a) (b) (c) are the same as in the furious type, though less accentuated. Then as to the periods (d) (e) the voice is entirely lost; from the very first he can only howl, without a trace of a bark. The lower jaw is paralyzed, and the mouth constantly open, the eyes are wide open, without expression, and always fixed in the same direction. The most marked symptoms are muscular debility, and loss of nervous power. The animal keeps his bed and sleeps at times. He shows no inclination to bite and if he did has not the power. The saliva is just as virulent as that of the victim of furious Rabies.

In the great majority of cases Rabies in either form, is fatal to dogs; but there are authentic instances both of recovery without, and with treatment which are, of course, the rare exception.

POST-MORTEM APPEARANCES, (AFTER DEATH BY RABIES.) The tongue and mucous membrane of the mouth and stomach are blue and almost black. In the cavity of the stomach are found, often, a black fluid like coffee grounds, and a strange collection of things which no healthy dog swallows; wool, hair, straw, pieces of wood, coal cinders, soil, fragments of linen, carpet, etc. Youatt and others found this symptom in all their cases, Bruckmuller of Vienna in 54 per cent.

WHAT IS THE PERIOD OF INCUBATION OF RABIES IN DOGS? Less than two months in 80 per cent of cases, rarely passing six months.

RABIES IN THE CAT. As this has been reported in Minnesota it is worth notice that the symptoms are the same as in the dog; and it is to be remembered that the cat, like the wolf, is most likely to attack the victim on the face and the head. All statistics agree in classing wounds of these regions as the most dangerous of all.

THE SYMPTOMS OF RABIES IN MAN should be well understood by physicians so as to be able to judge of a suspected case, and to relieve the mental worry and excitement so likely to accompany a suspicion of the disease. The following is from the same authority as supplied the vivid description of the disease in dogs :

"In man Rabies assumes the two forms already described, but the delirious and convulsive variety is the most common.

The established convulsive type naturally divides itself into three periods. In the first that of melancholia, which follows just after the period of incubation, the sick one, whether aware or not, of his danger, whether infant or adult, changes his character. becomes sad, taciturn, and avoids all society; he is besieged by sombre forebodings, has a constant and intense headache, and his sleep is disturbed by startling dreams. In some cases there is itching, or even painful sensations at the seat of the wound. This primary stage of the disease is sometimes wanting, and in any case does not last more than four or five days. It is in this stage that the patient oftentimes manifests an irresistible desire to walk or run; there is a general exaltation of muscular and nervous excitability replacing for the time the melancholy.

In the second stage, which is the one truly characteristic of the disease, a condition of general over excitement appears, the respiration become difficult, painful, the inspiration is cut up into frequent sighs. Little by little all the spinal nerves are affected, and there occur spasmodic contractions of the special muscles of the pharynx and larynx. There is increased activity of all the senses; noise—or the sight of water—or any brilliant object, the least current of air, an odor, a sound, however feeble, are often enough to provoke a convulsive spasm threatening asphyxia, and with protrusion of the eyeballs. About the second or third day occurs the frequent symptom of spitting; the mouth at first dry, becomes moist and fills up with mucus and froth. In very many cases the sick one has hallucinations of sight and hearing. The voice is rough, hollow, convulsive, spasmodic, broken and sometimes recalls the bark or the howl of the dog. During the convulsions the patient often bruises or wounds himself; he still has inclination to run, and to go away from home. These attacks alternate with melancholy and despair. Temperature runs high as in lockjaw, and increases for the first hour after death. It may reach 43 C. (109.4 F.).

In the third period paralysis has reached all the organs, the intelligence is clouded, the patient is exhausted, and surrenders at last when the centres of respiration and circulation are paralyzed."

THE PERIOD OF INCUBATION IN MAN. Brouardel's statistics are quoted in France where the diagnosis has been much more exact than in England or in this country. "In one series of 170 cases 87 per cent were rabid in the course of the first three months. In another series of 93 cases 78 per cent developed the disease within three months. He concludes that Rabies declares itself oftenest within two months after the inoculation; rarely after three months; and with exceeding rarity after six months. Below 20 years of age the mortality is 31 per cent and over that age it is 62 per cent."

SEASON OF THE YEAR AS AFFECTING THE OCCURRENCE OF RABIES. The statistics of l'Institut Pasteur for three years, agree in putting the maximum mortality at the end of winter and the beginning of spring. In July and August the disease decreases, reaching its minimum in September and October, to increase again in February. It will be noted that these results are the exact opposite of the seasons established by popular opinion.

SYMPTOMS OF RABIES IN RUMINANTS, CATTLE. Boulay, one of the ablest and most observant men of his time, summarises the observations made by himself on twenty-seven head of cattle who had Rabies.

“First day. Slight colicky pains, or something very like, as the animal no sooner lies down than he gets up again. The senses are excited, there is very sudden rise in temperature, itching pains at the seat of the bite.

Second day. Less agitation, slight tenesmus; lower temperature of body and at seat of the bite.

Third day. Commencing paraplegia (paralysis of the lower half of the body) strong tenesmus (straining at stool) the discharge from the bowels covered with mucus of a yellowish brown tint, spinal column not sensitive to pressure, and temperature falling. These symptoms are accompanied by bel-
lowing.

Fourth day. Complete paraplegia; violent straining to stool; excrement covered with frothy mucus; foaming at the mouth; bellowing more frequent.

Fifth day. Same symptoms with considerable fall in temperature; bellowing more rare; sense of taste not impaired.” Death by paralysis.

THE PERIOD OF INCUBATION was in three-fourths of these animals from three to six weeks, and in the remainder it varied between six weeks and three months. One dog bit all the affected animals, and it is not proved that domestic cattle bite each other when rabid. The inoculation with the brains of these cattle produced the disease.

C. N. H.

LEPROSY IN MINNESOTA.

REVISED TO JULY 1, 1894.

BY CHR. GRONVOLD, M. D.

The report relates in very conservative language the experience we have had for the last forty years with leprosy in Minnesota. In no other state that I know of are all known lepers registered and kept under observation, and all suspected cases carefully examined. The history of these cases has been very thoroughly studied. No further isolation than the use of their own beds and utensils is required, and this their own good sense and that of their relatives, as a rule, secures. It must be understood that the State Board of Health and the Local Boards have abundant power to enforce the strictest isolation, if found needful; but up to date there has not been any occasion for the use of such power, as the disease is limited to the immigrants, and has never appeared in the descendants of lepers, nor in anyone born in the state. It is under constant and careful observation, and has been for the last twenty-two years under the care of the State Board of Health. Of the twenty-one lepers now known to be living in Minnesota, but two are county charges, and all but three are able to work. All are Scandinavians—three Swedes and the rest Norwegians, and belong to the laboring class; none have leprous kindred in this country; in none is the disease known to have been caused by exposure to infection in this country; but in nearly every one there is record of exposure in Norway or Sweden. All cases are under the observation of the Local Board of Health and of the State Board, and every report of a supposed new case is immediately investigated and examined by a physician familiar with the disease. The facts here officially stated will interest the students of a disease about which a good deal more has been written than is actually known.

C. N. H.

Norwegians began immigration to America more than fifty years ago, most of them going to the Northwestern States—Wisconsin, Iowa and Minnesota—where they and their descendants form a considerable part of the population. Some of these immigrants were from parts of Norway where leprosy is endemic, and among them were some lepers. Norwegian physicians, aware of this fact, followed, to study the disease on foreign ground. Among them were Dr. J. H. Holmboe, surgeon

in charge of a leper hospital in Bergen. He came in 1864, and found twelve lepers, of whom two had the first symptoms after their arrival here. He thought their health better, probably, than it would have been had they remained in the old home. In 1869-70, Prof. Wm Boeck, of Christiania, Norway (joint author with Dr. Danielson, of Bergen of "*Traite de la Spedalskhed ou Elephantiasis des Grecs*, Paris, 1848," published by the Norwegian government), published his conclusions in "*Nordisk. Medicin. Archiv*," Band iii, No. 1. He found in the three states named eighteen cases of leprosy, of which nine had the first symptoms after their arrival in this country. All were proved to come from leprous families in the old country, except one, in which he suspected hereditary influence, although admitting the possibility of contagion. He ascribes all the cases to heredity, not believing the disease contagious. He thought lepers better off here in respect of their disease than they would have been in their own country. He says: "They have come away from the place where we see leprosy may originate spontaneously, and which certainly will favor its development when the disposition is inherited. They have settled on fertile lands, where they certainly have to work hard to make a living, but they generally undergo no hardships, as we in Norway understand the term. There is no work that can be compared with that done at the midwinter fisheries in open sea off the Finnmark coast, or the hardships suffered while tending the cattle on the high mountain plateaus, which causes so often bring out the latent leprosy."

Since 1870, when the above was written, investigations have been continued in Minnesota as to the number of lepers, their condition, and that of their families. There are medical correspondents everywhere in the state, who report all suspected cases to the State Board of Health, which then makes particular inquiries through its standing committee on leprosy, composed, since 1872, of the writer, and the Secretary of the Board. At this date, July 1, 1894, there are twenty-one lepers known to live in Minnesota, of whom eleven have the anaesthetic and ten the tubercular form of the disease.

Two cases of tuberculous leprosy died in 1892, having been lepers for fourteen and sixteen years, and have been dropped from the list. Two new cases were added in 1891 and two in 1892, two in 1893 and one in 1894, and of the seven five have the tuberculous, two the anaesthetic form of the disease.

Anaesthetic Cases.—In one the disease was first recognized at least five years ago; its duration in the other nine averages nineteen years. The two oldest of this class are, respectively, seventy and seventy-four years of age, and have had the disease more than twenty-three and seventeen years, respectively, while two others, sixty and fifty years of age, have had the disease thirty and thirty-two years.

Tuberculous Cases.—The average duration of the disease in these cases to date is six years, while in one the disease was first recognized a year ago. The longest duration of the disease in these cases is sixteen and fourteen years, in persons forty and thirty-six years old.

The experience in this country has not been very long, although it already includes several generations. Such as it is, some of its results are: 1. In no children or descendants born in Minnesota of lepers—there are great-grand children—has there been any sign of the disease discovered, although under frequent observation. 2. Up to date no leper has been born in Minnesota. 3. In many cases the disease was not recognized for a long time after the arrival of the persons affected in this country—how long it is difficult to state, as the first symptoms are obscure, not noticed, or misunderstood; but in every single instance the leper has some time had his home in some place in the old country, where the disease was endemic, while in but a single case has infection in this country been suggested, but as that came from a locality in the old country that has been for years a nest of leprosy, the possibility is that he got it there. These facts, as far as they go, seem to suggest that the disease in this country is not so easily acquired as in some other countries. Looking for the cause, some points present themselves for consideration.

1. New houses with new furniture and furnishings, in a new country, harbor no sources of infection, and the better economical condition promotes the sense of need for cleanliness, both for health and comfort—a cleanliness which seems in leprosy to be the main

reliance against contagion. 2. The commonly dry and always windy climate of this great inland plateau, with its great and sudden changes of temperature, open as it is towards the Gulf of Mexico, and towards the North Pole, may perhaps make it more difficult for the *materia peccans* to fix itself on persons and things. The hot summer that opens up the pores of the skin and drains the system that way, and the cold, stormy winters bracing up the body, may have influence in that direction. That the climate must have some influence in preventing the spread of the disease seems yet more probable, when we remember that the early settlers, often with a large family of children, lived for a long time in small, close and badly ventilated log houses, closer, even, than they were accustomed to in their old homes. Even if they did not bring with them such sources of contagion as unclean houses and old furniture, they at least had for some time old clothes, so that it would be a wonder if old and young could have observed the cleanliness necessary to prevent contagion if the effect of climate had not been of a nature to make contagion more difficult. It seems certain that the disease, once established, runs its regular course here as elsewhere, perhaps a little slower. 3. The change in the physical constitution of people who have lived here some time, the effect of acclimatization and of other influences, may make the individual less susceptible to contagion.

In 1888 Dr. G. Armauer Hansen, of Bergen, Norway, the discoverer of the *bacillus leprae*, came to this country to study leprosy in the immigrated Norwegians and their descendants. He had taken the position in 1874 that contagion is the only source at present of leprosy, and that the disease is not hereditary. He gives the results of his investigations:

"I cannot here relate all my observations in detail. I will only tell what I have found in regard to the occurrence, or rather the disappearance, of lepra in America (N. W. States). Of about 160 lepers who have immigrated into the three states named (Wisconsin, Iowa, Minnesota), thirteen are alive, whom I have seen myself, and perhaps three or four more. All the others are dead. Of all the descendants of lepers (and that includes the great-grandchildren of some of them), not a single one has become leprous. This is, in short, the result of my investigation."

NOTE. This form is to be used for reports as to Infectious Diseases of Domestic Animals, by Health Officers and Chairmen. Use one for each centre of infection—barn, enclosure, or pasture. Mail to the Secretary, Dr. Hewitt, Red Wing.


1. Name and P. O. address of the owner or care taker
.....
2. Number and kind of animals sick or suspectedsick;
suspected.
3. Name of disease and prominent symptoms of affected animals.....
.....
.....
4. When did first case occur?.....When reported to the
Local Board?.....When visited by them?.....
5. What V. S. called, and when? (send copy of certificate?).....
.....
6. Decision, and action of the Board in this matter.
.....
.....

Signed,

.....
Health Officer or Chairman,

.....Board of Health,

P. O. Address.....

 Write any further details here or on back of this sheet.
Always keep a supply of blanks in office of Board.

TUBERCULOSIS IN DOMESTIC CATTLE.—ITS CAUSE, SYMPTOMS AND PREVENTION. ITS DETECTION BY THE USE OF TUBERCULIN.

Of the infectious diseases which affect both man and domestic animals, and which can be communicated from one to the other, this is the most common and important.

AMONG MEN it is the leading cause of mortality; its average death rate (for the last five years) in Minnesota has been nearly 10% of all deaths, or at the rate of 107 deaths from this cause to 100,000 of the population.

AMONG CATTLE it is much more difficult to get even an approximate estimate, but from existing data the Bureau of Animal Industry of the Agricultural Department of the United States estimates 2% of the cattle in the most densely populated portions as tuberculous. In herds of choice breeds the proportion is much larger, as it is in dairy cattle and slop fed stock.

TUBERCULOSIS IN CATTLE *is often a very obscure and always a very Infectious Disease.*

The better the breed, the better the care, the greater the danger. Hence on the score of the safety of the herd, owners should know how to detect and weed out infected animals.

But it is not merely for this purpose, important as it is, that the law for the control of infectious diseases was enacted or this paper written. Tuberculosis has been carried directly from an infected animal to the body of the person who eats the flesh or drinks the milk of an infected cow. This transfer is not invariable but is so common that the danger is ever present, and for purposes of prevention, it should be assumed in every case of doubt.

Instances of this transfer are numerous and unquestionable, and there is good reason to think that the existence of tuberculous disease in children brought up on cow's milk is to a considerable extent due to it. Milk is a good culture medium for the bacillus of tuberculosis, that microbe has been repeatedly found in fresh milk; the disease is known to occur in the udder of infected cows, and has been found in suspected milk.

The evidence is not so strong, as yet, against the flesh of tuberculous animals, but it is increasing, and European nations who permit the sale of such meat are now requiring that it be cooked under steam pressure (thus destroying the bacillus) before being offered for human consumption.

In our own State the sale of the meat of tuberculous animals for human food is forbidden.

THE CAUSE OF TUBERCULOSIS in man and animals is the same, a microscopic vegetable cell that multiplies with great rapidity in different tissues and provokes local disease which may spread to various parts of the body. It is capable of living under very adverse circumstances outside the body; when dried and converted into dust it may be breathed into the air passages and lungs, and swallowed on, or in food. The most frequent location of the disease in cattle is the lungs into which it is probably breathed as above described. In this way a sick cow may infect a whole herd before being herself suspected, and may send the infection in her milk to a very wide and serious distribution.

SYMPTOMS OF TUBERCULOSIS IN CATTLE. The following is taken from the last report of the Bureau of Animal Industry, quoted from a Swiss authority:

"A dry, short, interrupted, hoarse cough, which the sick animals manifest especially in the morning at feeding time, still more after somewhat violent exertion. At first these animals may be full-blooded and lay on a considerable amount of fat when well fed. As the disease progresses they grow thin and show more and more those appearances which indicate diseased nutrition, such as a staring, lusterless, dishevelled coat; dirty, tense skin, which appears very pale in those regions free from hair. The temperature of the skin is below nor-

mal. The loss of fat causes sinking of the eyes in their sockets. They appear swimming in water, and their expression is weak. The cough is more frequent, but never or very rarely accompanied with discharge. The body continues to emaciate even with plenty of food and a good appetite, so that the quantity of milk is small. At times, in the early stage of the disease, still more in the later stages, the animals manifest considerable tenderness when pressure is applied to the front or the sides of the chest, by coughing, moaning, etc. Often all symptoms are wanting in spite of the existence of the disease."

Another good description is given by Prof. Law, which was re-printed in PUBLIC HEALTH IN MINNESOTA (Vol. V, Sept. 1889, p. 75).

DETECTION OF TUBERCULOSIS BY TUBERCULIN. The detection of Tuberculosis, by even the most experienced Veterinarian, is often impossible in the early stages of the disease if he judge by the means available up to a very recent date. For this reason Koch's discovery of Tuberculin (a glycerine extract from a culture of the bacillus tuberculosis, filtered through porcelain) and proposed by him for the cure of that disease in man, has been carefully experimented with upon animals for the early discovery of the disease, where everything else has failed. These experiments made in every civilized nation have been crowned with marvelous success, and the use of this agent is now our most trusted measure for the detection of this insidious and infectious malady.

I quote the instructions of one of the most capable and fortunate experimenters in this country, Prof. Leonard Pearson, of the Veterinary Department of the University of Pennsylvania, who kindly supplied me with the first samples used in Minnesota for this purpose.

He had the good fortune to be permitted to make his first trials under exceptional circumstances and to put the tuberculin to the severest test. Tuberculosis had invaded a choice herd of Jersey cattle owned by a wealthy resident of Philadelphia. There were 79 cows in this superb herd and the disease had been discovered but a few weeks before. At the suggestion of Prof. Pearson every one of those animals was tested with tuberculin and 33 reacted in a manner which has been taken to indicate the presence of tuberculosis. They were cows and heifers and to all external appearance as healthy as any cattle on the farm. At the date of the last report I have, 26 of these suspects had been killed, and in every one the disease was found, the results being verified by Dr. Shakespeare, and by Dr. Abbott, chief of the Bacteriological Department of the University of Pennsylvania. The others have been killed since, and the disease found in all. This careful trial, with such positive results, is but an addition to the similar experience of Bang in Denmark, Nocard in France, and other equally reliable observers.

METHOD OF USE. "Take the temperature of the animal at intervals for 24 hours before use and at about 6 p. m. on the day of trial, then, using a sterile hypodermic syringe, inject the prescribed dose of tuberculin under the skin, just back of the right shoulder blade. The skin should be washed with a 4% solution of carbolic acid before and after using the injection. The temperature should be taken every 3 hours for 12 or 14 hours. The rise in temperature begins from the 7th to the 11th hour after injection. In some cases the elevation of temperature will be 5° or 6° F. (to 106°-107° F.) In other cases it will be less marked, 2° or 3° being the extent of the rise.

The amount of reaction does not indicate the extent of the lesions but seems to depend on the stage of the disease, whether acute or chronic. *The test is best made at night* as the temperature of cattle, particularly cows, is very likely to be raised several degrees by excitement or irritation during the day, feeding, watering, milking, etc."

Tuberculin is therefore advised for the above purpose, and for the present will be supplied free of charge to Local Boards of Health to be used by Physicians and Veterinarians as directed in the instructions which will be sent with it.

Our supply of Tuberculin is furnished by the Chief of the Bureau of Animal Industry at the request of the writer, and is prepared in the laboratory of that Bureau.

C. N. H.

GLANDERS.

Farcy, Nasal Gleet, Chronic Catarrh,
Epizootic.

An Abstract of the Latest Information as to its Causes,
Prevention and Control.

Statistics of the Disease in Minnesota from March 1, 1885, to August 1, 1893.

DATE.	Animals Isolated	Animals Killed	Animals Released	Localit's Invaded	Counties Invaded
March 1, 1885, to October 1, 1885.....	231	132	99	76	31
October 1, 1885, to October 1, 1886.....	251	193	58	63	34
October 1, 1886, to October 1, 1887.....	185	118	67	78	39
October 1, 1887, to October 1, 1888.....	248	194	54	81	40
October 1, 1888, to October 1, 1889.....	102	57	45	59	36
October 1, 1889, to October 1, 1890.....	82	67	15	40	24
October 1, 1890, to October 1, 1891.....	132	72	49	53	23
October 1, 1891, to October 1, 1892.....	81	43	19	34	22
October 1, 1892, to August 1, 1893.....	99	36	36	41	21
	1411	912	446		

With the strictest enforcement of the law it is more and more important to be on one's guard against the cunning devices of horse traders, and others interested, who insist that early stages of Glanders are some other disease. They call them by various names and are able sometimes, by careful treatment and injections, to suppress the earlier symptoms so that they escape the careless buyer.

A sharp bit of work after the operation of a brisk physie, will frequently develop evidence of sickness in a suspected horse, but nothing is so reliable and speedy in deciding the presence or absence of any form of Glanders as the use of "Mallein," which is better than any test hitherto known to the Veterinarian or Physician. Its hypodermic use is harmless to well animals but almost infallibly, and practically always, detects the presence of glanders in any animal upon which it is properly used. It is not a patent or secret means, but is well known to scientific men; is the discovery of such men, and has been put to the severest tests by actual trial in nearly every civilized country and by the wisest experimenters, without any serious difficulty, or failure to serve the purpose for which it is used—to answer the question, "Is a given animal glandered or not?" It is furnished by the courtesy of the Chief of the Bureau of Animal Industry of the Agricultural Department through the Secretary of the State Board of Health, to all Local Boards of Health for the detection of Glanders, free of charge; provided, that the preparation is used as directed and the results of its use are reported on the blanks sent out with it. (See memorandum on Mallein and directions for its use, to be obtained of every Board of Health or of the Secretary of the State Board.)

VARIETIES OF GLANDERS.—The disease is most common among work horses and is usually chronic, and the essential symptoms are local. IN THE HEAD THEY ARE DISCHARGES FROM THE NOSE, WITH INFLAMMATION, THICKENING, AND OFTEN ULCERATION, OF ITS LINING

MEMBRANE, WITH A HARD SWELLING OF THE GLAND UNDER THE LOWER JAW. At first the discharge is glutinous, adhering to the skin and hair around the nostrils, forming soft greasy-feeling crusts of a deep brown color. Later the discharge becomes pus (matter) of a slightly greenish tint which many think very characteristic.

FARCY is an affection of the glands, and is preceded by some fever and constitutional disturbance. *It rarely attacks young, well-bred and well-fed horses, or the mule.* Its victims are usually the common-bred, or worn-out and old horses. The local affection consists of lumps (enlarged glands) just under the skin where it is thinnest and most sensitive, on the face, the neck, but most commonly inside the limbs. These lumps are often connected by the swollen lymphatic "cords," as they are commonly called, while the swellings are named "Farcy buds." Like the nasal swellings, these "buds" burst and become jagged sores, with raised edges and hard bases, slow to heal, disposed to get bigger and often with yellowish crusts. When well marked there can be no difficulty in recognizing this variety of the disease.

The acute forms of any variety begin with sharp symptoms, go on rapidly to characteristic evidence, and they are usually fatal speedily, (eight to ten days.) The chronic forms are often very tedious lasting for months. These are the forms which occasionally "seem to get well." Common experience shows that recovery is not proven nor to be relied on, as it frequently happens that animals apparently well give the disease to others, and much valuable stock has been lost in this way. This is the fact which makes the extermination of the disease so difficult.

GLANDERS in any of its forms or stages is a very infectious disease *not only to other animals but to man*, of which we have had several clearly proven instances in Minnesota; while, doubtless, others have died of "blood poisoning from unknown cause" which was really due to this infection.

IT IS AN INCURABLE DISEASE IN ANY STAGE, and even if certain stages were curable the risk to other animals of infection while such "cure" was in progress would be too great a risk to run. It is better and cheaper to kill the affected animal at once, for the safety of other horses in the same barn or pasture.

WHERE DOES THE DISEASE COME FROM?—Its cause is a specific one—a vegetable cell of microscopic size and exceedingly prolific. Without it Glanders cannot occur. In common experience the disease first appears in the hard-working, over-worked, horses or mules from livery, street railway and contractors' barns, which are rarely kept in good sanitary condition. It is usually carried into townships in such horses offered for sale by traveling horse traders, and in herds of so-called "bronchos" or western ponies. So much danger has been caused by this irresponsible trading that Local Boards of Health should treat such herds as infected till their freedom from disease is proven. Men in charge should be required to have the permit of the Board under Section 5, Chapter 200, Laws 1885, which gives it absolute control of the matter for public safety:

"SEC. 5. The said Local Boards of Health may make regulations in writing to regulate or prohibit the passage from, to or through their respective

towns, villages or cities, or from place to place within the same, of any cattle or other domestic animals, and may arrest and detain, at the cost of the owners thereof, all animals found passing in violation of such regulations, and may take all necessary measures for the enforcement of such prohibition, and also for preventing the spread of any disease among the animals to their respective town, village or city, and the immediate vicinity thereof."

These regulations should require that all persons desiring to bring horses or mules into the township, village or city for sale or to stop while going through with such animals, must report to and have the permission of the Local Board of Health, and conform to such regulations as that Board shall make. All citizens interested in preventing this most frequent method of distributing Glanders, should be called upon to co-operate.

Insist upon knowing where the animals came from, the name and address of the caretaker and responsible owner, and in case of sale or trade buyers should be urged to require a warranty of freedom from infectious disease. The chance of a "bargain" makes many men rely upon their own judgment in such buying, but does not often prevent their asking the State or Local Board of Health to call, and pay Veterinarians to discover their blunder and compensate them for their loss, which the law forbids.

NOTIFICATION OF ANIMALS SUSPECTED OR KNOWN TO HAVE GLANDERS IS OBLIGATORY FROM ALL OWNERS OR CARE-TAKERS.

"SEC. 8 Whoever knows or has reason to suspect the existence of any such disease among the animals in his possession or under his care, shall forthwith give notice thereof to the said Local Board of Health of the town, village or city where such animals are kept, and for failure so to do shall be punished by a fine of not less than fifty (50) dollars, nor exceeding five hundred (500) dollars, or by imprisonment of not less than thirty (30) days or more than one (1) year." (Chap. 200, Laws of 1885.)

HOW ARE LOCAL BOARDS OF HEALTH TO DEAL WITH ANIMALS REPORTED TO BE GLANDERED?

In case of doubt issue "Notice to isolate the animals" to prevent possible danger from them, till the Local Board can have advice of a Veterinary Surgeon to be "by them selected," that is, one in whom the Board have confidence and would trust with their own stock. Have him examine the suspected animal and fill Form 2, of the blanks for the purpose, furnished from this office, complying with all the requirements of the blank. The Board will be guided by his written advice, so given, and will serve a copy of the certificate on the Secretary of the State Board, with report of their action.

If the certificate reports the case doubtful, the Board will continue the isolation till satisfied, unless owner or care-taker will accept the use of Mallein, which decides the case in a few hours. Animals isolated after exposure to Glanders, or because they are suspected of having the disease, are left in the care and at the expense of the owner, because they are often fully able to work, and, until the disease is fully recognized, may be permitted to do so on the farm of the owner, provided he contract that the animal shall expose no one but his mate, and that neither shall leave the farm or associate with other animals till the isolation is removed by the Board who ordered it. The owner uses such

animals at his own risk and assumes the responsibility or danger of infection, to others, from them.

As soon as the fact of the existence of Glanders is established by the certificate of the Veterinary Surgeon selected by the Board as above, the Board issue the "Order for Slaughter" on blank provided for the purpose which is also for disinfection, and insist on its immediate execution.

BUT SUPPOSE (AS IS SOMETIMES THE CASE IN COUNTRY DISTRICTS) THAT A RELIABLE VETERINARY SURGEON OR HEALTH OFFICER IS NOT AVAILABLE, WHAT IS LOCAL BOARD TO DO? Isolate all animals reasonably suspected of the disease, or of having been exposed to it, till such time as a competent adviser can be gotten, and report to the Secretary of the State Board. In most well marked cases of Glanders, in any of its forms, the evidence is so clear that no one familiar with horses can be deceived after a careful examination and trial, as above suggested, and it is not uncommon for owners to ask to have such animals condemned. *Boards should induce representative horse owners to unite with them in careful oversight of suspicious animals and horse traders.*

HOW TO DIMINISH THE DANGER OF SUSPECTED CASES, AND TO DISINFECT THINGS AND PLACES AFTER THE KNOWN PRESENCE OF THE DISEASE. *Do not forget that thoroughness is essential to the success of disinfection.* The virus is easily destroyed by dryness, fresh air, and sunlight. It may be preserved for many days by moisture, darkness, and in water. Boiling water very soon, and hot water (above 160°F.) in a few minutes, are fatal to it. With *hot water and soft soap*, therefore, all harness, bits, blankets and other covers, may be surely disinfected. Straw and anything else used as bedding should be burned. Stables and stalls should be washed down with fresh and hot quick-lime as whitewash. Use a broom and apply the wash freely. Sprinkle the floors with fresh lime in powder, freely. After a few days whitewash again, sweep clean, burn the rubbish and the barn is safe. Warn all concerned not to handle glandered or suspected horses without great caution, and require all suspected cases to be isolated till the real disease is known.

The law for dealing with Glanders is Chapter 200, Laws 1885. (See "FULL FILE" sent to every Board of Health and to be kept for reference.) Section 1, makes it the duty of Boards of Health to isolate all animals having infectious diseases, or which have been exposed to infection. If left in the care of their owners, as is done for animals suspected of Glanders, it is at their risk and expense, and mostly for two reasons: First. That if able they may work without danger to other animals. Second. That the owner may have the benefit of the doubt, and the steady hard work will most surely and quickly develop the disease, if it exist.

The selection and pay of the Veterinary Surgeon is left to the Local Board of Health by Section 2 of the Law.

NO APPRAISMENT IS PERMITTED FOR A GLANDERED ANIMAL, AND NO COMPENSATION except "an equitable sum (the custom is \$3.00 to \$5.00 for each animal commonly, but that is regulated by the Local Board, who pay for it.)

It is the duty of all Local Boards of Health to keep the Secretary promptly informed of the existence of this, or any other infectious disease, so that the State Board may give any assistance in its power, and protect other localities from infection.

The free distribution of this memorandum to all owners of horses will be helpful. Read Chapter 200, Laws of 1885, for the duties and authority of Local Boards in the control of Infectious Diseases of Domestic Animals.

THE ADVANTAGE AND USE OF MALLEIN

FOR THE EARLY AND POSITIVE DIAGNOSIS OF GLANDERS.—We have made a very great advance in the work of exterminating Glanders by the use of Mallein upon suspected cases, and the experience already had in Minnesota justifies the statement that in no other way may the truth as to the existence of the disease be so quickly learned. Health Officers and Chairmen of Local Boards of Health are advised to be guided by its indications, when used as directed, in deciding the question of slaughter, isolation, or discharge of a suspected case. Owners miss the most positive evidence we have in refusing it, and should be urged to accept and use it. If they refuse in cases of doubt, the only alternative is isolation for at least thirty days.

Hitherto great hardship has been occasioned by the long period of isolation to which such animals had to be subjected for the safety of others.

The need of a means of so soon "clearing the record" which all have recognized, will induce Boards of Health to urge the use of Mallein, and owners to demand its use so as to avoid isolation and uncertainty as far as possible.

MALLEIN, an organic extract from cultures of the bacillus of Glanders is now an established means of detecting the existence of that disease sooner than the most skillful Veterinarian can do it, because, before it has developed any symptoms which he could recognize. While in Washington in April I made arrangements with Dr. Salmon, chief of the Bureau of Animal Industry, for a supply of this fluid to be used under the direction of Boards of Health by Health Officers or by Veterinarians.

This fluid is used by hypodermic injection. It is harmless (so far as is known) to healthy animals, but causes symptoms in animals having Glanders in any form, within 24 hours of its use, which prove its presence and justify a repetition of the test or slaughter.

We will supply it *free of charge* if used by Health Officers or Veterinarians under direction of Boards of Health, when the history of the case is reported to the Secretary with the request for supply, and a promise made to report results on blanks to be furnished with the instructions for use.

Mallein has been used as herein directed in more than 30 horses in Minnesota with positive results, verified in some cases by post-mortem since April and to date. July 31, 1893.

C. N. H.

CIRCULAR OF INSTRUCTIONS FOR THE USE OF MALLEIN FOR THE EARLY DIAGNOSIS OF ANY FORM OF GLANDERS issued by the Bureau of Animal Industry of the Agricultural Department.

By the courtesy of the Chief of the Bureau a supply of mallein will be kept constantly in our laboratory for the use of Local Boards of Health and issued as required. The only requirement for a sufficient supply is a full description of the outbreak, its use as directed, and a prompt and full report of result.

A post-mortem examination should be made of animals killed, specimens of diseased tissues removed, put in a clean small fruit jar, in pure glycerine, the jar promptly closed, labelled, and sent by express to the Secretary of the State Board.

"Directions for using Mallein, as prepared in the Laboratory of the Bureau of Animal Industry, for the Diagnosis of Glanders in Horses.

WASHINGTON, D. C., March 20, 1893.

"Make the test, if possible, with a healthy horse, as well as with one, or more, affected or supposed to be affected with glanders. Take the temperature of all these animals at least three times a day for one or two days before making the injections.

The injection is most conveniently made at 6 or 7 o'clock in the morning, and the maximum temperature will then usually be reached by or before 10:00 p. m. of the same day.

Use for each horse one cubic centimeter (15 minims) of the mallein solution as sent out, and make the injection beneath the skin of the middle of one side of the neck, where any local swelling can be readily detected.

Carefully sterilize the syringe after injecting each horse by flaming the needle over an alcohol lamp, or better, use separate syringes for healthy and suspected animals. If the same syringe is used, inject the healthy animals first, and flame the needle of the syringe after each injection.

Take the temperature every two hours for at least eighteen hours after the injection. Sterilize the thermometer in a 5% solution of carbolic acid, or a 0.2% solution of corrosive sublimate, after taking the temperature of each animal.

The temperature will begin to rise, as a rule, from four to eight hours after the injection and reach its maximum from ten to sixteen hours. On the day succeeding the injection take the temperature at least three times.

In addition to the febrile reaction, note the size, appearance, and duration of any local swelling at the point of injection.

Note the general condition and symptoms of the animal both *before, during, and after* the test. After four or five days the injection may be repeated if the reaction from the first injection is not entirely satisfactory.

Keep the solution in a sealed bottle and in a cool place; when it leaves the laboratory of the Bureau it is free from germs.

The experiments conducted at the Veterinary Experiment Station of the Bureau, have shown—

1 That the injection of the mallein causes a rise in temperature of 2° to 5° F. in all horses affected with glanders except sometimes in well developed or advanced cases of the disease, already having a temperature of 102° F. or above. In no case has the maximum temperature of a glandered horse, following the injection, fallen below 103° F.

2 On the glandered horse an abrupt, hard, painful swelling, 4 to 10 inches in diameter occurs at the point of injection. This generally begins to appear two to four hours after the injection, continuing on the next day, and increasing in size for one to three days, disappearing again in from three to nine days afterward.

(3) Subsequent injections in glandered horses gave a similar reaction, although frequently less marked.

(4) The symptoms and lesions of glanders are frequently aggravated, and acute symptoms often develop in mild cases by the mallein injection.

(5) Healthy horses frequently show a slight rise of temperature of 0.5° to 1.5° F. very rarely more. In no instance, however, was there a marked swelling at the point of injection. When a slight swelling did appear, it developed in from two to six hours after the injection, and disappeared again by the next day.

(6) Subsequent injections in healthy horses gave very little or no reaction."

LUMPY JAW.

(Actinomycosis.)

Its Cause, Prevention, Sanitary Management and Treatment.

CAREFUL inquiry by the State and local Boards of Health proves that there are many cases of this disease, in groups, scattered throughout the state, and a recent investigation of one of these outbreaks has awakened new interest in the subject. The following memorandum is to be one of the series regularly furnished to Boards of Health and Health Officers hereafter. Their attention is called to the fact that the disease is an infectious one, and when it appears in a herd, or in cattle using a common pasture, it is sure to be spread from the infected to the well. It is important, further, to make it widely known that the disease is a curable one if taken early, and that the means of cure are procurable at any drug store and can be used by the owner under the supervision and direction of the local Board of Health.

All animals affected must be isolated by order of the local Board of Health and not released for any purpose except by its order. If Health Officers and Chairmen will distribute this memorandum freely in all localities where the disease is found to exist, and keep a sharp lookout for evidence of its presence it can be "crushed out" and a very serious cause of loss to stock owners be gotten rid of.

Description of the disease (as given by Dr. D. E. Salmon and Theobald Smith): "It is a local disease due to the formation of peculiar tumors in various regions of the body, more particularly the head. In these tumors a certain

fungus (*Actinomyces*) is always present and regarded as the cause of the disease process. * * * * When they are incised a very close scrutiny with the naked eye, or at most by a hand lense, will reveal the presence of minute grains, which vary from a pale yellow to a sulphur yellow color. They may be very abundant or so few as to be overlooked. They are imbedded in the soft tissue composing the tumor or the pus of the abscess. With a needle they are easily lifted out from the tissue, and then they appear as roundish masses about the one-fiftieth of an inch in diameter. * * * * When examined in the fresh condition under a microscope magnifying up to 250 diameters the general structure is made out without difficulty. They consist of collections of roundish masses. Their outer surface is made up of club-shaped bodies radiating from the centre of the mass somewhat like a rosette. If the fungus is crushed the interior is found made up of bundles of very fine filaments, which are probably continuous into the club-shaped bodies. The addition of a dilute solution of soda, or potash, greatly aids the examination, since it removes the layer of cells adhering to the fungus which obscures its structure.

"These are the bodies whose presence causes sufficient irritation in the tissues, into which they find their way, to set up inflammatory growths, which sometimes multiply to enormous dimensions if the affected animal lives long enough."

The medical treatment is very simple, and at present seems successful, except in advanced cases where the bones are affected.

It is now conceded that the real germ of the disease is a minute vegetable cell (a microbe), of which the *Actinomyces* or "ray fungus," as it is called, is the degenerate representative, or perhaps the mature growth.

Where does it come from? It is supposed to come from certain grasses (rye is suspected) and to effect a lodgment with the sharp spur of the plant in the wound it makes in the mouth of the animal. However that may be, the disease is a communicable one either from infected grass or grains or (in infected herds) from the discharges of the sick on feed or utensils.

The disease occurs in nearly every organ of the body and is communicable to man. It doubtless spreads as other microbic diseases do, and therefore, while its history is not so clearly made out as tuberculosis or glanders, the public are entitled to the benefit of the doubt. It is for this reason that the offering for sale of the flesh of a lumpy jawed animal as healthy human food is forbidden by Boards of Health, and the courts have repeatedly sustained this action by condemnation of owners or butchers to a fine with confiscation of the meat so offered. Health Officers and Boards of Health must isolate all such cattle in the care and at the expense of owner if he wishes to submit them to treatment, which is his privilege, and at his cost.

The isolation must not be removed till the Board have the certificate of a competent Veterinary Surgeon, satisfactory to the Board, that the cattle have recovered from the disease or that they are incurable. In the last case the Board proceeds as for slaughter for glanders, using the same "form" for

the order and for disinfection of things and places.

The following is the original prescription, which can be put up by any druggist and used by intelligent stock raisers: Get of iodide of potash (best) 3 1-2 ounces, dissolve in 8 ounces (1-2 pint) of water. Of this solution give a large tablespoonful twice a day in a feed of bran mash for eight days, when there should be marked improvement and the swelling get smaller. After the eighth day use the same medicine, but give only half as much (two teaspoonfuls) twice daily. Isolate the animal, give abundant food, and if there are open sores wash them two or three times daily with the following: Boric acid (4 ounces) dissolved in a gallon of boiled soft water. Use a teacupful freely in each wound.

Two weeks' trial of the foregoing treatment ought to be enough for any curable case. When in doubt always consult a competent veterinary surgeon and take "no stock" in nor employ no one who claims a secret and better treatment.

Local Boards of Health will please call for and distribute this circular to all cattle owners, dealers and butchers as the surest way of putting them in possession of the facts and of crushing out and preventing the disease.

Please notify dealers that lumpy jaw cattle must not be shipped into or out of any locality in the state, and that violation of this rule will result in preventing sale, the probable loss of the animal and a penalty for dealing in stock having an infectious disease. Most dealers will gladly comply with so reasonable a regulation.

Local Boards will please inform the Secretary (address, St. Paul) of all outbreaks of the disease, or any shipping of suspected cattle, with their destination, and any other facts which will aid this Board or other local Boards in dealing with the matter.

C. N. H.

MINNESOTA STATE BOARD OF HEALTH.

THE LUNG PLAGUE OF CATTLE.

(CONTAGIOUS PLEURO-PNEUMONIA.)

Prepared by Order State Board of Health for Public Distribution.
By the Secretary.

May be obtained of State, or any Local Board of Health, without expense.

PREFACE.

PLEURO-PNEUMONIA of cattle threatens to invade our State. Its history is that of a slow insidious poison, which, once it has gained foothold in a district, or State, is only to be stamped out by a widespread slaughter of all sick and exposed animals. This slaughter, besides enormous pecuniary loss, is a fearful blow to an industry dependent so entirely upon the healthfulness of its products and the honesty of its records as the cattle traffic and the dairy interests. Read this circular and distribute it freely among cattle owners. *Remember, that "forewarned is forearmed," and how much easier it will be to keep this dreaded disease out of the State, than to drive it out should it once get a foothold.* Impress this fact and the need of watchfulness upon all, and set the example yourselves. You will promptly notify this Board, through the Secretary, of the location, number and history of suspected or infected cases, and in all matters of doubt or difficulty, rely upon our hearty co-operation and active assistance.

The law under which your own and this Board act in this matter, is Chapter 200, General Laws of 1885 (reprinted in first number of *Public Health*, March, 1885). This law was the one under which Massachusetts expelled this disease, and has been thoroughly tested in practice and the courts.

Your first duty is to keep a sharp lookout for the disease, and particularly to isolate, in care and at expense of owner, any cattle which (on competent veterinary evidence) you have reason to believe may have the disease, till it shall be satisfactorily proven that they are not so affected; or till, with proof sufficient, you order their slaughter and burial. In all cases have the carcass inspected after death, and attach a copy of the veterinary certificate of the disease, and post mortem examination, to a copy of the appraisement provided for in Section 3 of the law, and forwarded properly certified, to this office. No slaughter of such animal will be ordered by Local Boards till approved by this Board, when the State is to be held responsible for four-fifths of the appraised value. Note particularly Sec. 3 of the law, as to time in the State, of such animals.

The following account of the Chicago outbreak of this disease is submitted to show where our danger in Minnesota lies, and that constant and intelligent oversight on the part of owners and Boards of Health is the price

we must pay for reasonable safety. The question of inoculation for the disease will be discussed later. It has undoubtedly aided in the spread of the disease to healthy animals in Chicago.

A few weeks ago, by accident, Pleuro-Pneumonia was discovered in a few cattle on a farm adjacent to Chicago, by the Veterinary Surgeon of the State Cattle Commission of Illinois, who was fortunately consulted by their owner. He began an immediate search, and traced the infection to cattle being fed at the Phoenix Distillery in Chicago, (through a herd of milch cows, part of which had come from that place), and to other distilleries. The disease was next found in milch cows feeding in various places around the city, and is not yet thoroughly traced. It was found, further, that the disease had been in the Phoenix stables, for at least two and one-half, and probably for five years, or possibly more.

During this time the milk from these distillery cows had been sold as "Elgin," "Country," and other favorite brands, while the stables beggared description, as the writer can testify, for utter filthiness, as did the animals themselves. A worse "dairy" could not well be imagined, or one from which milk (the most susceptible of fluids) was more likely to carry disease. More than this, it was discovered that one herder, and probably many more, finding the disease in his herd, went to the stables and obtained pieces of infected lung which he used to inoculate the apparently well cows of his herd. This man assured the writer that some of his cows lost a good share of their tails, and some were very sick. They were now well, and he was sure could re-enter the infected stables with safety.

No better evidence of the slow, insidious character of this infection, and of the utter absence of all fear of the disease on the part of the owners need be produced. They confess to a knowledge of its existence for years, and to a considerable mortality. It, of course, paid, or their business would not be continued.

Owners and cattle dealers insisted, after its true character was known, that the disease was not Pleuro-Pneumonia; if it was, it was not infectious, and if it was infectious, it was only slightly so; a line of argument, which, despite its absurdity, occasioned the Cattle Commission much trouble, making their work which for the common good, should be quick and effective, tedious and much less successful than it otherwise would be.

The Cattle Commission of Illinois are further embarrassed by the defects of their law and the lack of intimate and mutual relations with local sanitary authorities and with the State Board of Health. Had the relations of the Health Department of Chicago and the Commission been of this character Pleuro-Pneumonia could not have existed in the Distillery stables so long undetected and uncontrolled, and have become a serious menace to the cattle interests of that city, of Illinois, and the northwest.

Traffic in cattle is fortunately at the minimum now, and much less than usual at this season, so that we have more leisure to plan for the future. The Governor established quarantine against cattle from Illinois, and has approved the Bill of Health required by this Board, a copy of which will be found on page 72. No case is known or believed to exist in the State at present, thanks to the slow advance of the infection.

The State and Local Boards ask the hearty co-operation of all interested in cattle, and if they will give us prompt information of suspicious lung trouble among their cattle, and will buy eastern cattle only on receipt of this Bill of Health, and affidavit of owner, and will isolate such cattle for thirty or sixty days after arrival, from other cattle, there will be little danger of the importation of the disease, or its spread if do come.

If it does come and get a strong local foothold, its total removal will be a very doubtful and expensive matter.

What is it? It is an infectious disease of the lungs and of the lining membranes of the cavities of the chest, peculiar to bovine animals. It is usually slow and insidious in its attack. It is not communicable to man.

Where did it come from? Europe to this country, and first appeared in New York in 1843.

Where is it now in this country? In New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, West Virginia, Kentucky, and Illinois.

Has it been expelled from any State which it has invaded? Only two—Massachusetts and Connecticut—it exists to day in all the rest.

How expelled? By the slaughter of every animal sick of the plague, or who had been exposed to its contagion.

Dr. Salmon, chief of the Bureau of Animal Industry, Feb'y 12, 1886, makes the above report with the exception of Illinois, which has been discovered since that date. Dr. Salmon adds a very suggestive paragraph. That though the disease has existed continuously in most of these States for many years the number of infested districts has not materially increased or diminished. He makes one very important statement: "The number of infested herds in the eastern States is so great (he reports 236) that no attempt has been made by his Bureau to notify them, as he has no power to enforce inspection, isolation, or slaughter of infected or suspected animals."

Do not cattle recover? and is medical treatment of no avail? They seem to recover often, but rarely so entirely as not to be a constant danger to healthy animals associating with them. Medicine does not cure, in the sense of recovery from the disease, and from all liability to infect other cattle. "Such cattle may appear in perfect health to the casual observer, or to the best judge of cattle, and yet scatter the contagion, and infect all susceptible cattle with which they come in contact."—Dr. Salmon. This is the testimony of all familiar with the disease.

How can the disease invade Minnesota? It was taken to Australia by one cow, to New York by one cow, probably to Chicago by one cow, and is just as likely to come to us in that way. We do not expect to find a first case on cattle trains or in stock yards, but in the close stables of city milkmen, or among brewery-fed cattle; or in county dairies and in the herds of breeding cattle, even the best stock.

It must never be forgotten that this disease *exists now* in New York, New Jersey, Delaware, Pennsylvania, both Virginias, and Kentucky, as well as in Cook county, Illinois, and that cattle for dairy or breeding purposes have come from one or more of these States, as from States in direct communication with them, into Minnesota.

How may the disease be recognized? By the peculiar dry cough and the very high fever of the first stage of the sickness when the local symptoms in chest or lungs are not very well made out. These, followed by the marked chest symptoms of the second stage, are reported to be characteristic, but the writer finds that experienced veterinary surgeons prefer to examine the carcass of a case or two, after death, before expressing a decided opinion. There the charges in the lungs are too marked to be mistaken for anything else. So our advice is, isolate the suspected animal, and if it die, examine the chest, if the

disease is lung plague, you will find one or both lungs in part or wholly diseased, and (if the case is severe) attached to the walls of the chest by layers of a yellowish and clotted matter.

Cutting into an affected lung, the diseased portion is solid, like a sponge full of a viscid fluid. The surface is streaked with a wonderful mixture of all colors, from crimson to brown. You will find the most marked appearance between the lobules of the lung. Of course this examination is to be made in such a way and place as not to endanger other cattle.

You will see there is no *official* bar between those herds and ours in Minnesota except such as this Board and the Local Boards set up.

A very vexatious feature of this disease is the fact that it may exist even in great centres of population and of the cattle industries, known to the dealers in the affected stock, but not known to the local Board of Health or to the State authorities.

How to Keep it out of the State? Official methods. The thorough co-operation of the State Board of Health and of the 1050 Local Boards of Health in every six miles square of our territory. The State Board is now distributing in various ways, full details of the history and symptoms of the disease. All suspected cases will be isolated till all doubt is removed, *when discovered*, and prompt notice sent to other States, and adjacent Local Boards of Health. The State Board is guarding against the disease from without as well as possible by requiring a bill of health in the strongest form. The Local Boards will not fail of their duty, but it must be apparent to anyone that so slow and insidious a disease can easily come in cattle who have been exposed and are not yet sick (weeks and even months may pass before an animal, surely infected, develop the disease). These facts established, and admitted, the point of this essay is made.

OTHER METHODS.

Buyers must be careful to demand a clear record for animals brought from other States, showing that they were well when shipped, and have not been exposed in anyway to the infection of pleuro-pneumonia or other infectious diseases of animals for at least ninety days before shipment, nor were so exposed in transit. This ought to be by affidavit and by bond of indemnity if such disease occur within ninety days after arrival and cannot be traced to exposure since that time. If this is not required by buyers in our State, then there is but one other method (which should be used whether the first is used or not), isolate such animals for at least thirty days (ninety when practicable) from others, as a reasonable, easy and safe precaution. If such cattle are sold before ninety days have expired since coming into the State, buyers should require a similar affidavit, or isolation there for thirty to sixty days.

Finally, if any case of obscure lung disease occur in any herd, let the owner in his own interest, isolate the animal and have an examination by a competent veterinarian, not releasing the animal till it is surely *not* suffering from pleuro-pneumonia. If it die, have an examination of the carcass to decide what it died of. In all cases of doubt, notify this Board, and every aid will be given to help in the solution of the matter.

Our arrangement with the National Bureau of Animal Industry, and with the authorities of adjacent States, are all that are possible, but cannot cover cattle who *may* have been infected, but are to all appearances, well, when inspected and have an apparent clear record.

The plain inference from the preceding statement is: Don't buy cattle from infected districts, or who must pass through infected districts coming to you. If you do buy under such circumstances, require a bill of health, and quarantine for at least ninety days. When the cattle arrive, isolate them thoroughly from all other cattle for at least thirty days, and if you can for ninety days.

Should suspicious lung disease occur, isolate the animal, take competent veterinary advice and notify your Local Board of Health, and the State Board of the fact. You better isolate a hundred and be mistaken, than to let a single case of the disease escape.

SCAB IN SHEEP.

We have before called attention to the duty of Local Boards of Health to control this disease by isolation, and by insisting that owners procure and use the proper remedies.

A considerable correspondence with Chairmen, owners, Veterinarians and others show that there is still much misapprehension on the subject.

Scab is an infectious disease caused by the presence, and irritation, of a minute insect which belongs to the same order of parasites as affects other animals and man.

"In sheep the symptoms are intense itching, the wool is torn off and white tufts hang on the dark surface of the fleece. The skin is thickened and rendered rigid by exudation into its substance, as well as by the accumulation of crusts on the surface. There is often a papular eruption and sometimes excoriations, or deep sores the result of incessant rubbing."

Scab is communicated to other sheep by contact, by little tufts of wool containing the insect or its eggs, from affected animals, and in any other way by which either may get from the infected to the well.

3.—Crowding, close and damp, and dark pens, with improper food, anything in fact which lowers the vitality of the animal makes them easier prey of parasites.

4:—To get rid of the disease, isolate all infected and suspected sheep from the rest of the flock, and give them prompt treatment.

It is not the intention or duty of Health Officers to prescribe for sick animals, any more than for sick men, but there are so many instances in which a competent V. S. is not available in remote country districts that it will further the purposes of Public Health to give a prescription quoted from a leading veterinary authority (Prof. Law of Cornell.)

"Use oil first, well rubbed in, to be followed by soap-suds to remove all scabs and crusts; then apply thoroughly with a brush the following mixture: (1) of tar one ounce; whale oil, 20 ounces. Or this: Half pound each of tar and sulphur, one pound each of soap and alcohol."

5:—The well animals should be put in a clean and fresh place, and the infected pens carefully cleaned; burn all rubbish, loose wool, straw and litter; whitewash walls, floors, mangers, and posts or corners used for scratching.

Isolation for infected animals means that they are to be excluded from sale or mixing with other sheep till well. They must not be driven over common highways, or in common pastures till well.

6:—This disease does not affect the quality of the meat, except as the animal loses "condition" by irritation and worry.

All animals isolated as having or suspected of having "scab" are in the care and at the expense of the owner till well.

The Local Board of Health may call a V. S. at its discretion, and always should do so if there is any reasonable dispute as to the character of the disease, this at the expense of town for information, not for treatment of the animals, which last is the business of owners.

7:—The object of isolation is to protect animals from the infection as above, and of disinfection, to destroy the parasites and their eggs. C. N. H.

INFECTIOUS DISEASES OF HOGS.

**A Paper Describing Some of These Diseases as They
Appear in Swine.**

WITH DIRECTION FOR THEIR RECOGNITION AND MANAGEMENT BY
LOCAL BOARDS OF HEALTH, OWNERS AND DEALERS.

By **CHARLES N. HEWITT, M. D.,** Secretary and Executive Officer.

COPIES FOR FREE DISTRIBUTION MAY BE GOTTEN OF LOCAL BOARDS OF HEALTH
OR OF THE SECRETARY OF THE STATE BOARD,
ST. PAUL, MINN.

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MINNESOTA STATE BOARD OF HEALTH.

OFFICE OF SECRETARY AND EXECUTIVE OFFICER,

ST. PAUL, MINN., Dec. 22, 1894.

To Local Boards of Health:

INFECTIOUS DISEASES OF HOGS.

Special attention is hereby called to the fact that certain infectious diseases of hogs are prevailing in many localities in the state, causing great pecuniary loss to farmers and dealers.

These diseases have been introduced from without, and are now being spread from locality to locality within the state.

The railroads have been instructed not to bring hogs into the state without certificate of competent veterinarian that they are free from infectious disease, and affidavit of care-taker or owner that they have not been exposed to it within three months. Within the state a similar certificate is required from local boards of health before acceptance for transportation.

The attached circular contains the latest information upon the subject, and the instructions of this Board. *Absolute isolation and thorough disinfection, as there directed, are our only means of protection*, and upon the promptness and efficiency of the local boards will, therefore, largely depend the crushing out of these diseases. Local boards will please apply to the Secretary for the number of circulars which they require for distribution, which will be sent gratuitously, with "Bill of Health" blanks. Copies should be given particularly to all interested in hog raising, and their co-operation earnestly solicited.

As there are believed to be several diseases at work, health officers and local boards are urgently requested to procure and forward to the Secretary, at the Laboratory of the Department of Public Health, University of Minnesota, Minneapolis, descriptions by competent veterinarians or medical men of the symptoms and post-mortem appearances of every outbreak. The spleens of affected animals are most likely to contain the germ of the disease, and, therefore, with descriptions of the outbreak please send sections of spleens, lungs or intestines by mail, prepared as follows:

Remove the organ by instruments without handling it and cut off as much as an inch square with sterilized scissors, letting it drop into an open-mouthed bottle (like a morphine bottle), which has been thoroughly rinsed just before in boiling water, and close with a cork treated in the same way, and seal; label properly, put in box with cotton or dry sawdust and forward by mail or express prepaid to laboratory as above.

The bacteriological investigation which is being made in our laboratory in co-operation with that of the Bureau of Animal Industry, Washington, seems likely to result in more positive knowledge of the causes of the diseases involved, and so better knowledge of the methods for their prevention or control.

Please report all outbreaks promptly to the Secretary, enforcing rigid *isolation and disinfection* on all suspected or infected herds.

CHAS. N. HEWITT, M. D.,
Secretary and Executive Officer.

INFECTIOUS DISEASES OF SWINE.

(SO-CALLED HOG CHOLERA AND SWINE PLAGUE.)

These diseases are again prevailing extensively in Minnesota, and the attention of local boards and of owners is called to the following circular:

For the purposes of this circular the conclusions of the Bureau of Animal Industry are adopted, and the following summary is made up from the report on this disease. (Fourth and Fifth Annual Reports, 1889, Washington.) Almost all fatal diseases of the lungs and bowels in swine go by this name; but it is now well enough ascertained that it should be restricted to a disease whose most reliable symptoms are to be learned on post mortem examination, which should be made as if the animal was to be prepared for food. "The spleen (milt) will usually be found enlarged and very black. Spots of blood from a pin head to a quarter inch, or more, will be found in the fat under the skin, on the intestines, lungs, heart and kidneys. When the larger intestines are opened they are found covered with these dark spots of blood, more or less uniformly, and entirely. Often the contents are covered with clotted blood. These are the usual symptoms in acute cases. In more chronic cases the pigs grow weaker, lie down most of the time. Eat but little, and usually have diarrhoea. Most of the cases may linger for weeks, meanwhile scattering the poison in the discharges. In such cases no delay should occur. Kill one and open the bowels; slit up and examine the large intestine, beginning at the blind end. There will be seen roundish yellow or blackish spots, having an irregular, depressed, sometimes elevated, surface. These spots are ulcers, and correspond to dead portions of the mucous membrane, and they are frequently seen

"from the outside as soon as the animal is opened. Sometimes the lining membrane has been destroyed."

In *Swine Plague* the lungs are the principal seat of attack (a broncho-pneumonia), the pleura (lining membrane of the chest) is secondarily involved. The bowels, if involved, show more of exudation, like that of diphtheria, than the peculiar ulcers of hog cholera. The rectum (lowest extremity of the large intestine) is often invaded in swine plague, rarely in hog cholera. The two diseases may occur, apparently, in the same individual; but usually may be distinguished as above. An inflammation, confined chiefly to the bowels, evidently infectious and fatal, though often of long duration, may, for sanitary purposes, be called *hog cholera*, even though the lungs are partially involved. On the other hand, an inflammation of the lung, extensive and fatal, though often of long duration, confined chiefly to the lungs, is the only severe inflammation known in the lungs of swine, and may be called, and treated as, *swine plague*. The virus of the first is the most persistent, as it can live in infected soil for months; and that of the latter is much less resistant. *For sanitary purposes treat them both alike, and always isolate sick swine.*

How does the disease occur? The ways in which it may reach a healthy herd are:

(a) "Pigs purchased from infected herds, or coming in contact with those from infected, in running over ground occupied by diseased swine, within a period of two or three months."

(b) Infected streams may communicate the disease to herds below the source of infection.

(c) Virus may be carried in feed, im-

INFECTIOUS DISEASES OF SWINE.

plements, and on the feet and clothing of persons from infected herds and premises.

(d) Some other animals may carry the infection, as *dogs, rats*, and, perhaps, mice.

All these means of carrying the infection are easily preventable, and sick and well may be on the same farm, and not far apart (if they are guarded as above), without danger, as on the experimental farm in Washington.

But if Hog Cholera has appeared in a herd—what then? The object in view is twofold

(1) "To prevent the virus from being carried to other farms, and infecting other herds."

(2) "To prevent loss of the entire herd; or, if that is not possible, to stamp out the disease in such a way that the ground shall not infect healthy animals subsequently introduced." Do it in this way:

(a) The dead must be immediately disposed of by burial in plowed, not pasture, land, and covered with a layer four inches thick of quick lime, and then with soil.

(b) Streams to be protected from pollution by the bodies of the dead, their discharges or by washings of the soil they have polluted.

(c) No animal to be removed from an infected herd or locality to another free from disease, except for slaughter, for at least six months after the last case of the disease has died or recovered. No removal, for any cause, except by permission of the Local Board of Health. The flesh of an animal dead of these diseases is unfit for human food, and should not be permitted to be sold except to go to the rendering tank, under the direction of the Local Board of Health.

What to do with the remaining, apparently, healthy animals.

(a) Remove them to inclosed, unaffected grounds, or pens, in a healthy locality, giving them the best of care and food.

(b) Destruction of all diseased animals. Owners may be allowed to have medical care for sick animals, at their own will and expense, if strictly isolated by themselves, and treated as possible sources of infection to others, under the supervision and regulation of the Local Boards of Health, who report to the State Board the facts in each case.

(c) Compel burial of the dead. (See a.)

(d) Repeated, thorough, disinfection of infected premises.

(e) Great cleanliness as regards both surroundings and food, to prevent them becoming infected.

For Disinfectant, the best and cheapest is ordinary unslacked lime to be scattered in powder one-fourth inch thick over infected grounds and floors, and in the proportion of two pounds to the gallon of water, used as a whitewash for wood work, in and outside buildings.

It is very important not to let infected hogs run at large, scattering the poison in a way to make disinfection impossible. They must be kept to their inclosures for that reason.

The law (Chapter 200, Laws of 1885) requires owners and any others having knowledge of the disease to report all infectious diseases of animals to the Local Board of Health, it promptly reports the same to the Secretary of the State Board, who will co-operate, in every practicable way, with owners and Boards to prevent, or stamp out this fatal, but easily preventable, disease.

C. N. H.

BILL OF HEALTH

For animals going from place to place in Minnesota, or to
places outside State.

Place.....

Date

Owner

Where from.....

Where to.....

Route.....

Description of animals. (kind, number, health).....

Form VII. Infectious Diseases of Animals. 12-24-94. 10M.

BILL OF HEALTH FOR ANIMALS.

Prescribed by the State Board of Health of Minnesota.

Signed by inspector of State Board, or of Local Boards, having control of infectious diseases of animals, and to be used for all cattle,
horses or other domestic animals six months in the State and going from one place to another in Minnesota,
or into other States or Territories, or to Provinces in Canada, requiring a Bill of Health.

Place and date of inspection.....189.....

Where from..... Date of shipment.....189.....

This is to certify, that I have this day personally inspected the following described animals, the property of
..... of.....

and to be shipped via (Specify route.)

Description of animals. (kind, number, health).....

I find the same to be sound, and free from any contagious or infectious disease of domestic animals.
After due inquiry I am satisfied that said animals have not within the last 90 days been kept, or in any other way exposed to infection, in any
locality in which infectious disease of animals exists.

Dated at.....this.....day of.....189.....

REMARKS:

(Sign official title in full.)

(OVER)

AFFIDAVIT OF OWNER OR CARE-TAKER.

For Minnesota Animals Going from Place to Place in Minnesota, or Out of the State.

To be made at same place and time, as attached certificate.

I,.....having first been duly sworn, depose and say, that
.....is the owner of the animals described in attached certificate; said
animals were shipped from.....via.....
Date of shipment..... They are going to.....
via.....

Said animals have been in the state for six (6) months next preceding this shipment, and within 90 days of shipment
they have not had or been exposed to any infectious disease of animals, and are now, to the best of my knowledge and
belief, sound and free from disease.

Subscribed and sworn to before me by the said.....this.....
day of.....A. D. 189.....

This Bill of Health and affidavit are for the use of persons shipping Minnesota animals from one place to another in, or to places outside the
State. A duplicate is to be sent to this office. Both copies are to be sent if the endorsement of this Board is required. If the *record is clear* the
animals may be forwarded and a certified Bill of Health be sent to destination.

Any officer discovering infectious disease, or reason to suspect exposure to such disease, will detain the animals, properly isolated, reporting
by telegram for orders. By order State Board of Health of Minnesota.

CHARLES N. HEWITT, M. D.
Secretary and Executive Officer.

Address: St. Paul, Minn.
REMARKS:

BILL OF HEALTH,

For Animals Coming Into or Passing Through Minnesota.

Place.....

.....

Date.....

Owner.....

.....

Where from.....

.....

Where to.....

.....

Route in Minnesota.....

.....

Description of Animals.....

(Kind, Number, Health.)

.....

.....

.....

.....

.....

.....

Form VI. Infectious diseases of animals. 12-24-94 10M.

State Board of Health of Minnesota.

BILL OF HEALTH FOR ANIMALS.

COMING INTO OR PASSING THROUGH THE STATE OF MINNESOTA.

Prescribed by the State Board of Health of Minnesota.

To be signed by an inspector of State, Territorial or Provincial authorities, having control of infectious diseases of animals, and to be used for all cattle coming into Minnesota, or passing through, and to be unloaded at any place there for transfer, feed or water.

This form should be made in duplicate. One copy to be sent directly to Dr. Hewitt, Secretary State Board of Health, St. Paul, Minn., who will arrange for the least possible delay or bother to shipper, IF RECEIVED IN TIME. The other copy to be retained by the care-taker or owner, and to be shown when required.

Place and date of inspection.....189.....

Where from..... Date of shipment.....189.....

This is to certify that I have this day personally inspected the following described animals, the property of

.....of.....

and to be shipped via (specify route).....

.....

(Description of Animals. Kind, Number, Health.)

I find the same to be sound and free from contagious Pleuro-Pneumonia, Tuberculosis, Actinomycosis, Hog Cholera or any contagious or infectious disease of domestic animals.

After due inquiry I am satisfied that said animals have not, within the last 90 days, been kept, or in any other way been exposed to infection, in any locality in which the diseases named or any infectious diseases of animals existed.

Dated at..... this.....day of.....189.....

(Sign official title in full.)

REMARKS:

(OVER)

AFFIDAVIT OF OWNER OR CARE-TAKER.

To be Made at the Same Place and Time as Attached Certificate.

I.....having first been duly sworn, depose and say, that
.....is the owner of the animals described in attached certificate; said animals
were shipped fromvia.....
Date of shipment..... They are going to.....
via.....

To within 90 days of shipment they had not been exposed to Pleuro-Pneumonia, Tuberculosis, Actinomycosis, Hog Cholera, or any infectious disease of animals, and are now, to the best of my knowledge and belief, sound and free from disease.

Subscribed and sworn to before me by the said.....this.....
day of.....A. D. 189...

Any Health Officer finding cattle suffering from infectious disease, whether coming to the State, or passing through (the last only if unloaded for any cause), will isolate them in the care and at the expense of the owner or care-taker, dealing with them and disinfecting cars as provided in Chapter 132, Laws 1883, Chapter 200, Laws 1885, and the Penal Code of the State, Sections 324, 325. Report immediately by telegraph and mail to the undersigned. Shippers and care-takers will be prepared to show this paper to Local Board of Health where the cattle are unloaded for distribution, or for feed or water. *Telegraphic notice from place of shipment to the undersigned of destination, route and probable date of arrival will enable him to prepare for and facilitate the necessary inspection and save time and delay to all concerned.*

Address, St. Paul, Minn.

CHARLES N. HEWITT, M. D.
Secretary and Executive Officer.

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